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Smokeless London.

HE appearance of fog six weeks before the month of November, the recollection of last winter's experiences, and the fact that all the physical conditions necessary for their recurrence have again presented themselves, afford a gloomy prospect for the millions of men, women, and children who are forced by circumstances to spend the coming winter in London. Persons who have already taken flight, and we know of many, have every reason to congratulate themselves upon the change. An echo of the dismal forebodings of unfortunate journalists who have returned to town after their autumn holiday will reach them on the sunny heights of Italy in time to confirm the wisdom of their early exodus. Their retrospect of London will not be marred by the remembrance of any premature disappearances of the sun at mid-day, nor of breakfasting by gas-light, nor of dangerous gropings in unutterable darkness for the turning into some familiar street. To these fortunate few, London may be only the London of the parks in June, and the story of the fog no more than a subject for kindly commiseration in letters written to their benighted friends from the regions of perpetual summer. But what is to be done for the Londoner by profession or by the decrees of Providence, who, let his wishes or his lungs be what they may, must face this ordeal of an intolerable atmosphere? Some effort ought surely to be made to discover if possible the sources of the evil, and no time should be lost in providing a remedy.

The first part of the problem may already be said to have been successfully solved, for the connexion between yellow fog and smoke, long suspected, has at last been proved. It can be demonstrated experimentally that the ordinary course of nature, in the case of our densely-populated cities, has been arrested. Envelopes of oleaginous tar surrounding the aqueous particles of the mist are discovered to be the medium that retards the dissipating influences of the sun. Dr. Frankland's experiments upon the effects of smoke on the evaporation of water have traced the principal cause of the evil to its source, and the direction in which scientific effort can alone be successful has been pointed out with the certainty of a complete induction. It appears that every inhabitant of a large town is a contributory to the mischief from which the community is suffering; but since the necessities of our civilisation demand the use of coal, it is only natural that the public should turn round upon science and inquire if the supply of these wants is incompatible with the blessings of an uncontaminated atmosphere.

If we suppose the case to be referred to a man of science with a wide experience in this particular field of inquiry, the course he would most probably pursue would be to examine first into all that had already been done to get over the difficulty in the case of fuel used in our great industries. Secondly, he would inquire if any of the apparatus which has been proved to be efficient in these cases can be made applicable to the domestic consumption of coal; and, in the event of his being unable to afford any reasonable hope of their ever becoming generally adopted, he would require to offer some alternative method of getting rid of the evils complained of. We cannot be far wrong in adopting this course, and inquiring, in the first place, if any apparatus is in successful use among our manufacturing processes that could be applied to our domestic hearths.

We will take one or two typical instances, in which the incentives to economy in the use of coal have stimulated efforts that have been crowned with complete success, not only in avoiding waste and saving money, but as regards the purification of the atmosphere, which is the natural consequence. The industry that holds the most prominent position in these respects is the iron trade. For many years the only way to make money in the manufacture of iron has been to save it, or, in other words, to produce it at less expense than one's neighbours. The efforts to attain this object have led to innumerable inventions, many of which are more expressly devoted to the saving of fuel. The escape of smoke is incompatible with this object, and hence the hundreds of appliances that have been introduced for consuming it. Turning to the blast-furnace, which is the most gigantic apparatus in existence for the combustion of coal, and which is fed, not by shovelfuls, as in the case of ordinary furnaces, but by tons, it must be confessed with regret that there is nothing whatever to lead us to hope that what has been done in the past to improve it, or is ever likely to be done in the future, will be applicable to the conditions of a domestic fire.

The first great advance that was made upon the more primitive methods of combustion in the blast furnace was the introduction of the hot-blast. This exceedingly simple appliance consisted of an apparatus made up originally of little more than a fire burning so as to heat a pipe, through which the air required for the consumption of the coal was passed on its way to the furnace. The heated air was a great improvement on the previous method of admitting it at the temperature of the surrounding atmosphere, but though a great economy was effected, the problem of complete combustion was by no means solved by its adoption. The next great improvement has become general only within the last few years, and it is not yet by any means universal. It consists in re-using the waste gases that previously escaped in the form of smoke and flame from the mouth of the furnace, by burning them in the ovens that heat the hot blast. An immense saving of fuel has been attained by the adoption of this improvement, and the blast furnace, instead of being as it once was, one of the most wasteful and offensive appliances in the iron trade, has now become in its more perfect form one of the most economical and the least troublesome as a source of pollution to the atmosphere. Looked upon as a test of what can be done, the improvements referred to are of special interest in their bearing upon the consumption of fuel upon a large scale, but, unfortunately, they are altogether inapplicable when used away from the superintendence of skilled, or at least practised workmen. Here, then, in the case of the most successful apparatus for avoiding the pollution of the atmosphere in the whole range of the iron trade, we find a positive blank as regards the application of these improvements to an ordinary domestic fireplace. The reconveyance of the waste gases from the drawing-room fire into a combustion chamber would be as impracticable as making use of them to heat the air that supplied the draught.

In other departments of the iron industry great economies have been effected in the consumption of coal; but there seems to be no more reason to expect them to be applicable to the fireplaces of London than are the improvements of the blast-furnace. But the inference that may be drawn from the apparatus to which we are now about to refer is of wider application. The blast-furnace is an appliance by itself. If we have to turn from its economy and its smokelessness with regret, as not even affording a suggestion as to how these improvements could be applied so as to ameliorate the miseries arising from the prevalence of smoke in our great cities, the disappointment is alleviated by a consideration of the unique character of the apparatus, both as regards its function and its size. But no such consolation is to be found in the case of the recent inventions for saving fuel in other departments of the iron trade, because these really embrace all the conditions that are necessary to the complete combustion of coal in every possible manufacturing process that requires large quantities of heat. The regenerative furnace of Dr. Siemens consists of a practical application of scientific principles that is available for an immense number of purposes besides the conversion of iron. The furnaces of Mr. Spence, which go even further in the direction of theoretical completeness, and which are in daily use at Woolwich arsenal, are also capable of the most various applications; but in neither case is there any likelihood of these ever being practicable upon the miniature scale of a domestic hearth. Not only an intense heat, but a steady heat, is absolutely essential to the success of both, and these conditions are necessarily precarious in the case of a household fire that may at any time be left to go out, or nearly out, at the discretion of those who are the recipients of its warmth.

In the whole range of our national industries

the appliances to which we have referred, more especially the improvements in the blast furnace and the regenerative system of Dr. Siemens, are those which are representative of the progress that has been made, and the inquiry therefore naturally rises, are they applicable in a practical way to the question of the domestic consumption of coal in such a vast community as that of London? We are reluctantly compelled to confess that they have in no way advanced the settlement of this most important problem, and it may even be said with truth that they have not even contributed to its solution. If they have had any influence at all, we are inclined to believe that they have rather retarded our progress than advanced it, because they have held out vague hopes to the great majority of the public that what has been done in the case of the iron trade may one day be applicable to the domestic hearth. If such hopes had even a possible chance of fulfilment, the constant expression of them might contribute to their being ultimately realised, but we confess that they appear to us to be altogether illusory. The reasons upon which this belief is based rest upon the fact that the domestic hearth as used in England differs, not only in degree, but in kind, from every apparatus in the iron trade, or any other industry in which the problem of complete combustion has hitherto been successfully solved.

It is quite true that the fuel is the same, and that the phenomenon of combustion depends in both cases upon an admixture of air with the burning coal. It may even be said with truth that there is nothing to prevent the most perfect system on a large scale being adopted in miniature; but this brings us to what is the real point of departure between the large and the small method of using ordinary coal, and constitutes the difference in kind to which we have already referred. The element of a very high temperature, which is attainable in a large furnace, and which is essential to its economy, is practically impossible in the case of any apparatus on the scale of an ordinary fire-place, and this high temperature is just as essential to complete combustion as a due admixture of the substances that go to produce the phenomenon. Without this element the most perfect reproduction of a large furnace on a small scale, even supposing it to be practicable, would be altogether unavailing as a smoke-consuming domestic hearth.

It is in this absence of high temperature that we discover reasons for the failure of innumerable appliances on a small scale for solving the problem of complete combustion as it occurs in the case of the domestic use of coal. In many of these the quantity of air supplied is in excess of what is necessary, and frequently the mode of applying it is all that could be desired. In others, by ingenious methods of forcing the escaping gases rising from a fresh addition of fuel to pass through the clear heat of a previous charge, from which the smoke has already escaped, an excellent result is obtained. But yet the causes of failure in all these cases is practically the same. Absence of a high temperature in the first set of appliances is just as fatal to success as it is in the second; for in both instances the calculations of the inventor are completely upset by the very common domestic condition of a fire on the point of going out, to which fresh fuel is added in excess. It is then, in spite of every ingenuity, that a state of things occurs which is practically absent in the case of all large furnaces, and the inevitable consequence is an escape of smoke from the chimney.

The point to which we have more especially drawn the attention of our readers is one that has not escaped the notice of men of science, who have made the pollution of the atmosphere their special study. The wonder is that some definite proposals have not yet followed, even from the present state of our knowledge with regard to the combustion of fuel on a small scale. Dr. R. Angus Smith, who has made not only many most important original contributions to the solution of the problems connected with the purification of the atmosphere, but whose special business it has been for many years to digest the labours of others, says, in his work "Air and Rain," when speaking of coal-smoke,—"It is not from want of air, or oxygen, that the black smoke is not burnt, the amount of air here" (referring to certain furnaces and chimneys which he had examined) "is found far in excess of that required. Now, patentees have too much confined themselves to the supply of air, a commodity easily given, but not so easily used. The want is in reality heat." If these remarks are applicable to the case of boiler furnaces on a large scale, they are much more significant in the case of ordinary domestic hearths, where the attainment of a very high temperature, evenly maintained, is practically impossible. If, then, great heat is essential to the complete combustion of ordinary coal, and if it is not possible to obtain it in the domestic consumption of large towns, we are forced to conclude either that the pollution of the atmosphere must go on indefinitely, or that we must fall back upon some modification of the fuel which is at present in use. It must always be borne in mind that conditions of temperature which are quite incapable of coping with the rich carbonaceous products of our coal-mines in their ordinary state, are nevertheless amply sufficient to produce the phenomenon of complete, or at least smokeless, combustion, when a portion of the smoky constituents of the fuel have been removed. It is practically impossible, even in an ordinary open fireplace, to produce smoke from coal out of which gas has been extracted to the extent of from 3,000 to 5,000 cubic feet per ton, and the material resulting from the operation is in every way superior to common coal. It must not be supposed that the removal of one-third, or even one-half, of the total gas contained in coal results in the production of coke. On the contrary, it leaves us with a residue that will produce the cheerful fire so dear to the heart of every Englishman. If the extraction of some proportion of the gas contained in ordinary coal is the only possible way in which a great city like London can be made absolutely smokeless, it would surely be wiser to adopt this alternative at once than subject the community any longer to the continually increasing evil of a contaminated atmosphere.

It is difficult to realise the extraordinary addition that would be made to the amenities of existence within the metropolitan area if such a course were successfully carried to a conclusion. The London of the early morning is full of subjects that attract attention on account of their pictorial charms. The river, the bridges, the great highways, the lofty towers, seem as if witnessed for the first time when first seen in the crystal light of the brightening dawn. But the glory is soon overcast. The toiling millions at their morning meal are the earliest witnesses of the change. The smoke ascending from the humble hearths soon mingles with the denser volumes from the West; and the leisured and professional classes, who rise at a period of the morning when 100,000 homes have contributed their quota of pollution, know nothing of the beauties of London in the early dawn.

In summer a curious spectacle is seen by those who take the trouble to watch the atmospheric changes of the day. In warm weather, as the use of coal is almost entirely confined to the cooking of food, so we find the smoke of the town and the meals of the community are altogether synchronous. The common experience of the wealthier classes is to waken in an atmosphere of smoke or fog. This is the time when London breakfasts. If a gentle wind is blowing up or down the valley of the Thames, the smoke-fog of the morning meal will roll away when the fires that cooked it ave gone out, and may be discovered in a murky cloud, as far away as Hampton Court, before the time appointed for rekindling the culinary hearth. It is during this interval,—often about eleven o'clock,—that upon going into the parks, we glory for a few short moments in the simulated freshness of the country air. The mist that rises from the ground is silvery-white, and the sunlight falls on the foliage of the trees unsullied by the dingy haziness which seems at other times to take a refuge among the labyrinth of leaves. Again the workman's meal comes round, and the smoke that rises from the fire that cooks his rasher of bacon is soon seen mingling with the contributions of chimneys connected with the operations of luncheon. Then, except the wind be strong, London is grimy for the rest of the day, and the dinners of the West End keep up the nuisance till the period of the setting sun. But, in winter, no lucid intervals occur. The demand for heat goes on the whole day long, and it only needs the combination of an aqueous atmosphere to produce the horrors of a genuine fog.

If, then, all this can be avoided by the simple expedient of removing a proportion of the gas from the coal, it seems only reasonable that this should be done. The smoke that at present escapes is wasted heat, and only soils our houses and our clothes. If it were first extracted from the coal it would give us light, and the tar, instead of enveloping the particles of mist and rendering them impervious to the action of the sun, would be available for the dyeing of our garments.

We have no wish to disparage the importance of many ingenious and useful inventions for economising fuel in domestic hearths. Many of these, and notably the slow-combustion stoves, in which the important element of time is introduced to allow of the more complete combustion of the fuel with the air, are excellent in their way; but the present deplorable condition of London and all our great cities must be looked upon as a commentary on their inefficiency to bring about a radical improvement. At the best they only economise the fuel, and leave the problem of complete combustion on a small scale, and without skilled attention, unsolved. Meantime, the discomforts and dangers arising from smoke and fog are becoming more pressing every day, and it appears to us that if the removal of a certain proportion of the gas from the fuel used in our great cities is a practicable and economical expedient, and *primâ facie* it appears to be so, then the sooner some such course is adopted the better it will be for the health and the wealth of the whole community.

By cheapening gas, and so leading to its more general use in cooking and heating, the course proposed might, in a secondary way, further assist in producing the desired result.

HEALTH AND THE HOUSE-BUILDER.

Of late years,—truth to tell very much too late,—what may appropriately be called a new school of doctors has been established, the school of "prophylactic" doctors; and a very good school it is. Inasmuch as prophylactic medicine can only give effect to the most radical of its precepts by co-operative alliance with the building trades and the architectural profession, we propose in this article to initiate, not to say a better acquaintance between the two,—for, up to the time being, there has been no acquaintance at all,—but an acquaintance.

We will not hesitate to assume, without offence, that the majority of native builders, and some few native architects, have not learned Greek, and therefore do not know what the word "prophylactic" means. It means *preventive*, and something more; which something we shall acquire a better idea of when we explain that "phylax," or "phulax," is a guard or sentinel, and the prefix of "pro" means that he is stationed well in front in guard over some body or bodies,—something, or things,—stationed behind. Prophylactic medicine, then, has for its object the prevention of disease by the adoption of judicious safeguards, instead of the curing of disease when it actually comes. Seeing that English people are not nomads, living in tents,—shifting their tents from spot to spot,—free to the breezes, the breezes free to them, but passing most of their lives,—the whole of their sleeping lives,—in substantial, permanent habitations; seeing that those permanent habitations are mostly constructed without any sort of previous acquaintance or intercourse, much less interchange of view or opinion, between house-constructor and house-occupier; it stands to sense that prophylactic doctors can never have a fair field on which to work with full effect until a good relationship shall have been established between them and the building community.

Unquestionably the most radical point to be kept in view when constructing a house, with regard to permanent sanitation, is the nature of the concrete or foundation upon which it is to be constructed. If the foundation be of festering germ-originating, malarious gas-evolving materials, nothing can go well with the health of those who inhabit that house, until the festering has exhausted itself by lapse of many years,—perhaps many generations.

When, in a neighbourhood where building is going on, we see a board announcing "Rubbish may be shot here!" the public may take it for granted the permission thus liberally accorded will meet with literal fulfilment. Odds and ends will be thrown there,—"rubbish" in its most obnoxious sense. We have had the curiosity, this sometime past, to take stock of metropolitan foundation-building rubbish, and

have got quite accustomed to see the predominance amongst it of preserved meat tin canisters, and old shoe leather. It might have been thought that the manufacturers of prussiate of potash would have had something to say about the old shoes; leather, like horn and hoof, being a factor in their chemical process. This, however, does not appear to have been the case; at any rate, it is not the case to an extent that can satisfy any prophylactic physician. The preservative virtues of tan notwithstanding, leather will rot in time; and whilst rotting will give off injurious emanations. It is the preserved meat-tins to which the most injurious effects of such a foundation as we have described are mostly attributable, and every day those tinned provisions coming more and more into use, the evil is exacerbated.

Coming now to the practical question up to which our remarks have been leading:—What practical means can be adopted for destroying or counteracting the malarious influences due to such a foundation? A mixture with earth would be satisfactory, but real honest earth is not in the majority of cases available to the urban builder. Earth is Nature's own disinfectant for organic decomposable things buried underneath it. We see what earth can accomplish in this way when applied to earth-closets. Well-ordered cemeteries and churchyards, again, supply another example of what earth can do in disposing of organic emanations. In the month of July, 1877, there existed some six-and-thirty thousand graves in Kensal-green Cemetery; and if we assume for present needs that each of these graves held five corpses, the assumption may not be far wrong. This gives 180,000 corpses for the graves alone, without reckoning those in the catacombs. The earth of Kensal-green Cemetery is by no means well adapted for its purposes, being too aluminous,—clayey,—and too wet. Nevertheless, the object proposed to be accomplished is accomplished with tolerable completeness. If, then, urban builders could obtain good honest earth-mould for mixing with their foundation rubbish, injurious emanations would not ascend; this not being available, quicklime is the most practicable, though not the best of substitutes. Lime does not act in the same manner as earth; there being not only difference of degree; the difference is radical. We can only understand in what the variation consists after contemplating the nature of decomposition products that a rubbish foundation such as we have assumed would evolve. Whenever organic matter, of whatever kind, decays, the evolution products resolve themselves into the two classes of inorganic or dead, and organised or living. To the first category belong ammonia, pure and simple; hydrosulphate of ammonia, more popularly known as sulphuretted hydrogen, and more fashionably as sulphide of ammonium; carbonic acid, more fashionably known as carbon-dioxide and carbon-anhydride; marsh gas, together with other products not so important. To the second category belong microscopic organised germs. Whenever animal matter decomposes, nitrogen and sulphur must be evolved in one form or another, seeing that nitrogen and sulphur are invariable constituents of animal bodies. When vegetable bodies decompose, there will be very little sulphur to evolve (most vegetables containing no sulphur), and if we regard the products of vegetable life as a whole, not much nitrogen. Practically every body is cognisant of the truth that decomposing vegetable bodies yield products much less offensive to the sense of smell than animal bodies, the explanation of which is that vegetable bodies contain much less nitrogen proportionately, and very much less sulphur. As for the latter, if such vegetables as garlic, onions, shalot, leeks, and the rest of that tribe, all belonging to the botanical natural order *liliaceæ* be excepted, and mustard, cress, cabbage, together with kindred vegetables comprised in the botanical natural order *cruciferæ* or *apiaceæ*, sulphur may be banished from consideration as an element of vegetable life.

Contemplating now the effects on health of the gaseous products just specified, ammonia,—*i.e.*, ammoniacal gas,—is, sanitarily, the least injurious of the lot; yet such persons as would affirm that ammoniacal gas when diluted by atmospheric air to such a degree that breathing the mixture is not sensibly repugnant to the lungs, and habitual living in the mixture not irritating to the eyes, ceases to be injurious to health, would do well to accompany on his rounds some medical man who has a patient, or patients, living in the small apartments over mews. In these residences the presence of ammonia may always be detected by smell alone; and the injurious consequences of dwelling in such an atmosphere will be seen in the general aspect of the dwellers. With the groom himself things may be moderately well under general circumstances, seeing that he is more out of doors than the others; but even the groom, should he happen to cut himself, will discover an effect of breathing the ammoniacally vitiated atmosphere in the long time it takes for the cut to get well. Ammonia, though about the least injurious of the non-organic emanations from decomposing matter, is assuredly not to be ignored in that respect. As for sulphuretted hydrogen and its combination with ammonia, both are, or can be, deadly poisons. One inspiration of sulphuretted hydrogen, undiluted, would infallibly kill the incautious breather on the spot; nay, even when diluted, rapid if not instaneous death might result, as it has been known to have resulted. Some fifteen years ago the following incident was recorded in the newspapers:—Some individual endowed with more chemical faith than chemical wisdom chanced to live in the vicinity of a street-drainage grating which evolved evil odours; whereupon he, having heard or read that oil of vitriol was a great purifier, threw some oil of vitriol down the grating; then applying his nose and taking a sniff to learn if the purification was complete, fell down dead. So injurious is sulphuretted-hydrogen that, even when much diluted, it may kill by skin absorption, as was proved long ago by some French veterinarians. They put a horse, all but his head, into a caoutchouc bag; then charged the bag with a mixture of atmospheric air and sulphuretted hydrogen, having only sixteen per cent. of the latter. By conditions of the experiment, it must follow that, should the animal be affected by the sulphuretted hydrogen, this could only result from skin absorption. Under this treatment the horse died.

Marsh gas, or light carburetted-hydrogen, already enumerated as being amongst deleterious gaseous emanations, may always be detected in the water of stagnant pools, charged with organic decomposing matter. From the water of such pools it may be collected. Not many years since, indeed, this was the only source from which investigators could obtain light carburetted hydrogen for experiment; no artificial method of preparing it being known. In marshy, fenny situations this gas abounds. These localities are always and everywhere insalubrious, but especially when situate in hot climates. The unhealthiness of localities where rice is grown is proverbial, rice being really an aquatic grass. Habitual inhalation of an atmosphere charged with marsh-gas has been thought by many pathologists to be the immediate cause of ague, or marsh-fever. An equally probable hypothesis is, however, that the disease in question results, not from inhalation of the gas itself, but from inhalation of minute germs or spores, organised, and, by microscopic aid, sometimes, perhaps always, visible, and co-existent with the gas.

The second category of disease-creating, invisible agents,—invisible, that is to say, to the naked eye,—organised germs, have only had their existence visibly demonstrated in quite recent times. Very soon after microscopic inquiry had revealed the existence in nature of an immensity of littleness in counterpart to the long-known and contemplated immensity of greatness, the very probable idea dawned that just as the microscope had rendered visible the existence of certain minute things, which hitherto had not been suspected to exist; so, probably, even microscopic vision had its limits. It was reasonable to suppose the existence of myriad small living things, which not even the microscope could render manifest. Probably this is the case, but, leaving hypothesis for the safer ground of experiment, we will now state how the visible existence of some living germs at least present in the atmosphere was demonstrated. The plan adopted was most ingenious, and when stated will be plain. *Imprimis*, the two points must be apprehended that gun-cotton dissolves in ether, giving a transparent colourless solution; and that gun-cotton wool, like ordinary cotton wool, can be made to act as a filter. Apprehending these facts, a French philosopher tried the following experiment:—Passing a current of atmospheric air for a certain time through a mass of gun-cotton wool, packed tightly in a glass tube, then dissolving the gun-cotton in ether, and examining microscopically the solution, he found abundant germs. Conclusive though this ingenious experiment was up to the stage at which we left it, the truth which it was made to disclose is only half told. The air which had been filtered through the gun-cotton was passed into a glass vessel, into which some broth had been put; and, due time having elapsed, it was found that the broth so circumstanced would not putrefy, though a duplicate sample of broth exposed to unfiltered air for an equal time and at the same temperature putrefied. This beautiful experiment opened a large field of speculation. The fact had been long known to experimentalists that all putrefiable matters, so far as experiments had gone, disclosed to the microscope a crowd of living organisms, in every case of specific kinds according to the species of matter undergoing putrefaction. In this way it was known that putrefying flour-paste was crowded with eel-like animalcules, which, indeed, have acquired the name of "flour-paste eels," from the resemblance. To whatever putrefying thing the microscopist turned his regard, he found specific organised forms. In most cases these organised forms were vegetable, of the fungus or mushroom nature; in other cases, as, for example, in putrefying paste, the specific organisms were animalised, though an abundance of fungoid growths constituting mould were found too. To an inquisitive mind the question immediately presses for solution,—Where do the living things referred to come from? Either they must be spontaneously generated, or else developed from germs, spores, eggs, or whatever else we choose to call those minute initial points of vitality. The belief in spontaneous generation is of great antiquity, but as experimental science advanced, it came to be scouted, only surviving in the minds of tidy housewives, who, one and all, protested, and continued to protest, up to the period of development of the scientific female, that dirt bred (*i.e.*, spontaneously generated) fleas. Of late, however, a school of scientific men, invading the domain of scientific females, pronounced their belief in spontaneous generation too. Many still continue to hold that opinion, but how they can consistently do so in presence of testimony furnished by the gun-cotton experiment repeated again and again up to the time being invariably with the same results, is to the preponderance of thinkers extraordinary. Chemists, when regarding the atmosphere chemically, are doubtless right in defining it to be a mechanical mixture of four volumes nitrogen and one oxygen, together with a comparatively minute but variable portion of carbonic acid. Prophylactic doctors, architects, and builders, however, must form a more extended idea of the atmosphere than this. They must contemplate it as being charged with a multitude of germs all ready to develop into fuller life, on finding resting-ground suitable for their development. If the objection be alleged that the germs are not an integral part of the atmosphere, but extraneous things contained in the atmosphere, the sole result is to import a metaphysical disputation on a practical matter, not altering practical indications of teaching in any degree. It must not be understood that the atmosphere exclusively is concerned in the diffusion of germ life. On the contrary, these little organisms pervade articles of food and drink. Few pathologists would at this time feel justified in denying that Asiatic cholera is alone communicable by the actual ingestion (*i.e.*, swallowing) of specific germs. Asiatic cholera is quite a modern disease, only dating from 1819. Its first victims were individuals who had been eating some rice from a crop on which had been observed a growth of a peculiar mould never previously seen. Not all microscopic germs are prejudicial. Some perform demonstrably useful work in the economy of nature. Without the presence of germ life there could be no fermentation of any kind. We have already seen how, in the absence of germ life, putrefaction (*i.e.*, putrefactive fermentation) could not be established, and the same inability applies to every other variety of fermentation. Hence springs the designation under which certain diseases are classed as being "zymotic" or fermentive. Perhaps the fermentive theory of disease has received more extensive application than is warranted by scientific demonstration. For example, that bane of the English climate,—consumption,—is considered by many pathologists to be refer-

able to the presence and development of specific germs; and on this assumption the hypothesis has been based that the pine-forest cure,—as it has been called,—of consumption, owes its efficacy to the circumstance that patients lodged in the depths of a pine-forest have to breathe, during their sojourn, an atmosphere charged with turpentine; which, like in this respect to carbolic acid, is destructive to minute forms of organic life, whether vegetable or animal. Assuming that we have rendered obvious the intimate connexion which naturally subsists between house-construction and prophylactic medicine, we would ask whether the connexion is not too often violated, and in such a radically important matter as house foundations, whether the violation may not be expected to prove the cause of future disease? If a foundation of chemically objectionable materials there needs must be,—such as the old shoe-leather, sardine-boxes, and meat-cans, to which we have adverted, —ordinary prudence suggests the need of disinfection. It is, unfortunately, too much the custom to go to work empirically in the employment of disinfectants, forgetting that such bodies, though having one common generic name, are endowed each with specific action. It by no means follows that a disinfectant best against a certain class of impurities may not be the very worst against others. Quick-lime, for example, has a sort of popular repute of acting as a disinfectant on every possible offensive thing, and under every possible condition. Its range of efficacy is large, no doubt, but cases may be easily specified in which lime is totally inert,—other cases in which it is injurious. Lime, not being volatile, is not atmospherically diffusive. It cannot, therefore, purify air except the air be forced through it. Quick-lime will be the best available purifier in the case of having to deal with a festering slowly putrefactive mass. It will destroy the germs to the action of which putrefaction is due. It will decompose hydrosulphate of ammonia and fix sulphur. It will rapidly corrode and render unputrefiable all organic materials. These comprise a fair list of advantages to the credit of lime as a disinfectant. On a future occasion we may indicate some of the abuses of lime regarded as a prophylactic agent, and explain the mode of action of certain other disinfectants.

BUILDING AND BUILDING MATERIAL IN CANADA.

Next in interest to the living humanities of a people comes architecture, which, interwoven with all, survives them all,—crystallisation, as it were, of the sum of facts that go to make up a nation's existence. This is what is drawing the attention of new-light students so markedly to the contemplation of old-time monuments, nor can we expect to furnish a less worthy, if less durable, subject for scrutiny to our successors at the far future end of time's vista.

Canada now means an empire covering half a continent, and, rapidly growing homogeneous, must powerfully influence the world at no distant date,—perhaps (such are the mutations of fortune) destined to really become the Greater Britain. Much of our bone and sinew, a good deal of our healthy brain, is being exported to Canada; the workers are building up the country with force and with patience. Of what, then, are built the houses of the workers? Canada is much thought of as a land of snow, but her summers are nearly as characteristic a feature as are her winters; those are hot enough, so that if there are to be found some snug temporary huts composed of snow, there is a wider range of building materials from which to choose. As for these snow huts, however, they are occasionally met with in districts where timber is poorly accessible: mining regions, or the banks of some rivers to which resort the Indians and trappers in winter time. They can only be successfully made after a fresh snow-fall in moderate weather, when the snow is no longer of its usual dry and powdery nature that forbids its being moulded. These huts are, when possible, made over a hollow cone of brushwood, but where this is not possible, they are formed like big ant-hills with a hole in the top through which the smoke of the fire inside may find egress. Over this hole are placed two short columns of packed snow, and upon these a slab of the same material, so that no snow can enter. Doors are extemporised of blanket or bear-skin, the internal fittings of the hut being of very primitive kind; and yet it is comfortable enough.

It is rare, however, that wood is not obtainable in the older provinces, so that the cosy dwellings of the shanty-men are far oftener met with than is the snow-hut. Varying according to the nature of the timber of which they are made, and not intended to last, all agree in being substantial and warm. The shanty-man, or "lumberer," is a man of independent spirit, who, slinging his rifle behind him and shouldering his axe, enters the wilderness with perfect composure, regardless of the lack of milestones and highways. He knows north from south by the "dip" of the trees, and cuts his own road when need be. Being sociable, he prefers company, yet often does his prospecting alone,—his first care, having met with a suitable field of operations, being the erection of his shanty. He carries with him no carpenter's set of tools: his axe is his one weapon. With it he fells trees and cuts them into lengths; how large may be these trees, and in what way he builds his shanty, are points that depend upon whether he have help or not. If alone, he drives two saplings into the ground at each corner of his shanty, and between each pair drops lengths of light timber, slotted close to their points of insertion, so as to receive the cross-bars. These being placed, the roofing is laid on, and the slope made afterwards. One side is modified by the necessity that exists for a door, but the principle remains the same: uprights driven into the earth in pairs, and firmly bound together at the tops, and, sometimes, the centres. Moss or cedar-branch packing does the rest; a chimney is made of four roughly-hewn slabs of wood, a short length or two of timber rolled indoors, when, having spread his couch of fragrant cedar-brush, the shanty-man lies down to enjoy his first pipe. When the lumberer is, as often happens, only one of a large party, his house is more strongly built. Sills having been laid, uprights, grooved on two sides from top to bottom, are tenoned in. Down these grooves are slidden horizontal timbers, squared at the ends, but otherwise "in the rough"; lastly, door, chimney, and windows are provided. Many of these shanties are adapted to withstand a bombardment from all but the heaviest of the old smooth-bore guns. Where timber is valuable, they are taken apart on leaving, and go to make the raft, which is floated over a dangerous course of hundreds of miles, and along the broad breast of St. Lawrence to Quebec. Otherwise they are left standing, to mock the unfortunate explorer who may have lost his way in those wilds with the promise of accommodation that he will not find. Yet, wooden houses do not exclusively belong to the professional lumberman.

So rapid has been the growth of many parts of Canada, that where thriving towns stand to-day, a few years ago was nothing but the unbroken forest. Here, when the settler first came, he staked out his farm and deliberately erected cottages and outhouses of rough timber. These stand to this day to witness to his marvellous upward progress in material prosperity. Toilsome work it was, this felling of trees and drawing of stumps, but here lies his farm smooth as a lawn, except where the plough has left its even furrows, and here still stands the cottage which saw the first "stumping-bee," with its array of immense bon-fires turning night into day. The farmer is proud of his house, and will not have it pulled down; his children may do that, says he, and sure enough they will by and by.

The face of the country in civilised Canada is fast changing. But, if you will enter his house you will admit that the farmer is, not without reason, proud of his dwelling. Neatly wainscoted inside, and well, if roughly, finished, there are no signs visible of the rough exterior. There is an upstairs, too, where the beds are skilfully made to project from the walls, as in the bunks of a ship. Possibly the farmer's first ideas of carpentry were borrowed from the sleeping accommodation of one or other of the badly-arranged sailing-ships that used to be thought fit enough for emigrant ships in the good old days of thirty years ago.

In the infancy of Canada, while towns were thus built of timber, the Government-house was wont to outstrip the rest, both in workmanship and grandeur. Private and public, that those were no contemptible residences may be inferred from the fact that many leading citizens prefer these old structures for their present town residences to any of modern contrivance built of brick or stone. There are, in Canada, still hamlets to be found in which town-hall, school, and churches are all of wood. While such is the case with respect to the older provinces, the same holds good in the prairie regions of the north-west, wherever wood of any dimensions is accessible. There, the half-breeds build with round timbers; from 16 by 16 to 16 by 24 square feet being the usual area of foundations. Sills are laid, as already described, six posts hewn, one for each corner, and two in the middle, lengthwise; grooves of 2 in. are cut in the posts and plates to hold these. Timbers are next cut, tenoned to fit grooves, and slipped in, thus making the sides and ends. The cracks are plastered within and without, and whitewashed. For the roof, poles are laid rafter-fashion, and filled in with clay or mortar, mixed with grass, puddled into the mass at one end, the butts of the grass projecting from and covering the clay. This plan of roofing is recommended to the notice of English farmers, as being cheaper than thatch, and quite as serviceable.

Most people are aware that there is a scarcity of large timber in the north-west, so it may be said that pine is imported to Winnipeg from Minnesota. Poplar and dressed white pine sell at $25 per 1,000 ft. Most of the houses in Manitoba are of frame, but brick is coming into use. It must not be thought, however, that the country is destitute of timber, for spruce, aspen, and stunted oak are found in abundance, and large enough for many purposes. Beyond the Rocky Mountains lies British Columbia, chosen home of giant timber-growths. The Douglas and Menzies firs, and the cedar, reach 250 ft. in height, whilst even the pretty maple attains 150 ft. The birch is thought tall at 70 ft., and is only found at the edges of British Columbian forests. This tree is, however, found beyond the prairies in most of Old Canada, and serves a number of useful ends besides this of house-building. Birch-bark makes the Indian's light canoe, which, when he meets a portage, he carries upon his back to the next length of smooth water, to re-launch it afresh there. Birch-bark is his thrifty squaw's medicine, and is the material of which her husband's leggings are wrought. An inner lining membrane of the birch-tree is used by the Indians as paper, whereon to paint records of prowess in the chase. Birch-bark serves also for the covering of tents, and, twisted into cordage, for fishing-lines. The Old-Country settler, glorying in the sharpness of his axe and the strength of his thews, despises such flimsy material, but the Indian knows better than to do hard work for a sentiment.

Next in order to massive timber for building purposes comes lath and plaster, perhaps at this day the most generally used material. It is a source of wonder to strangers how quickly and cheaply arise neat rows of houses in Canadian suburban districts, but if they watched the process, they would cease to be surprised. Every prosperous labourer hopes to build his house: a feat which he often accomplishes, in spare intervals between working-hours, with his own hands.

This is how he does it. When possible, he makes a good stone foundation, but timber does very well, and then he gets through the heavy work of erecting the frame, as already described, only his corner-posts need no grooves.

When soundly placed and capped, he nails carefully-fitted strips of 1 in. pine between the frame works, top and bottom, so that the edges are presented. Across these vertical pieces he tacks light laths, not too close together, and finally plasters the whole surface with mortar, forcing the plaster between the interstices of the wood work. For the inside, a smooth mortar is used, while for the outside, a coarse kind is thought better; indeed, it is usually thrown, instead of laid on, and often made to take an artificial wavy surface. Occasionally, plastering is altogether omitted outside, and planking substituted, but whichever plan be adopted, the result is a serviceable and comfortable building. The roof is made at a slope sufficient to divert the heavy snow-falls, and upon the rafters, close together, laterally, and overlapping each other, are laid wooden shingles, which take, in Canada, the place of slates.

Only two small nails are needed for the upper corners, and the work is begun at the eaves. It is better to have two rows of shingles. These essentials of a Canadian building are cheap, and, taken altogether, durable, lasting for nine or ten years, but have many disadvantages, among which not the least is their liability to catch fire in the hot months.

Many a street has been burned down by the settling of a stray spark upon the wooden roof of a building adjacent to the one which was burning. So well known is this that no sooner does a fire show itself than householders mount to the roofs and cover them with wet blankets. Shingles also warp beneath the intensity of an August sun, whilst they have a bad habit of absorbing water during unusually protracted rainfalls. In spite of these defects, shingling is a flourishing trade. Numbers of "shingle-mills" exist all over the country, where the hum of circular-saws never ceases during the day. The writer had several months' experience of this craft, and is prepared to state that shingling is, in the late autumn, very cold work, and, owing to the slippery state of the ice-glazed roofs, dangerous. The roofing of houses is possibly a trade in England, as house-painting and window-glazing certainly are, but the writer found it expedient to undertake small contracts in each of these branches, together with a good many more alien to the subject of this paper. Whether slate will ever take the place of the Canadian shingle is uncertain: many public buildings are thus roofed, it is true, but only where expense and weight are of no consideration, and slates have an unpleasant faculty of retaining heat longer than is desirable. Canadian slate, such as is ordinarily used, is not of good quality; that is to say, it cannot be split into thin sections, and is far more absorbent than English or French slate. Where houses are for the most part so light as in Canada, heavy roofing is not desirable, and thus, shingling is, in spite of all to its detriment, likely to hold its own for many a year. But the inventor of a material which, while equally cheap, should be proof against fire and water, would certainly make his mark in the Canadian building world. It may be thought straining a point to bring the ordinary roadway under the head of "building," yet the fact is that in Canada the "side-walks" are usually made of wood. The only exceptions are found in several large cities, where stone has been thought more showy. Bearing upon the matter in hand, attention is drawn to the recent report of the Home Metropolitan surveyor upon pavements: in it, preference is given to wood over both stone and asphalte. This refers to wooden blocks for the carriageway; in Canada such paving is much in favour, but wooden planking for the sideways is not known in England. The only conditions upon which planking can be laid on natural ground are "sleepers" and "piles," as occasion may suggest. When in good repair, nothing could be better than these roads, but sometimes town councils and corporations are forgetful of the public safety, and great holes in the planking beset the unwary.

With the development of the country, timber is in ever-increasing demand, so that, with this home consumption and the large export, no wonder that there are upon the Ottawa river and elsewhere saw-mills by the score, turning out millions of boards each day, while, on approaching the newer districts, the hum of the saw-mill is invariably heard. The immense piles of boards that line the river-banks might seem fabulous to one who had not seen them. Indeed, the rivers are in many instances covered with sawdust so thickly as to conceal the water for miles, while the smaller streams are even apt to be entirely choked. There seems, however, to have been some recent legislation to prevent this growing abuse, so it may be reasonably inferred that the myriad trout-streams which beautify Canadian rural neighbourhoods will not cease to present their seductive promises of healthful recreation to the explorer. If only somebody could utilise this sawdust, what a mine of wealth would he have ready to hand! It has been attempted to mould it into blocks for fuel, but with indifferent results, the cost being too great, and the fuel not burning without being subjected to a constant air-blast. Should, however, a solvent be found which, while ensuring a pasty consistency without changing the material chemically, should permit of its being injected under pressure with air, the result would be a spongy mass that must burn readily. This has not yet been done, but it is quite possible in theory.

Now that Canadian cities are growing in wealth, and have more at stake than formerly in case of fire, an event only too common all over North America, there is a strong feeling in favour of doing away with the wooden streets that court destruction from any chance spark. In all large towns, recent bye-laws provide against the erection of wooden buildings within the town limits. All fresh edifices are being built of stone or brick, usually the former. Whether it be that clay is not plentifully found in some parts of Canada, or whether the cost of brickmaking is greater than that of quarrying stone,—at any rate, brick is commonly regarded more as a curiosity than as the simplification of the architectural executive which it is in England. Such brick buildings as are found are well constructed, although the bricks seem sometimes to have been insufficiently baked in the kiln. Stone of various kinds is plentiful enough in most parts of the Dominion, though large areas of the best arable land are without so much as a pebble. Even here, by digging to a moderate depth, beds of rock are reached which, where they are at their lowest dip, are often found to make natural reservoirs for salt brine or petroleum, both important Canadian industries. In Guelph and its neighbourhood, situated within the fertile peninsula formed by the great lakes, are large beds of magnesian limestone, so that this thriving town,—a city within the past year,—is as substantially built as any place in the world. Taking advantage of this cheapness of building material, the churches and public buildings have been ambitiously conceived. Sandstone and granite are found elsewhere, and upon the Upper Ottawa is an abundance of veined marble.

In the district of Muskoka, one of the free-grant tracts, but poorly adapted for farming, the face of the country is seamed with large, outcropping banks of rock of the sterile Laurentian formation. It is of no use in the neatly-finished applications of modern fashionable architecture, nor, indeed, can it be advantageously wrought at all; if ever utilised, it most be as rough material. Hence it serves only to form the backs of the settlers' rude cabins, or as banks whereon to trail the vines that require a supply of reserved heat during the frosty nights. But when Canada has, in consonance with her hopes, emerged victorious from the peaceful contest of the colonies for supremacy, should she desire to erect a pyramid to hand down her fame to the world's end here is enough stone and to spare. Treated as indicated, these rough boulders could, without much cost for blasting, and for transit, be worked into magnificent fanes that should redeem the age from charges often brought against our own—of being puny in conception, in execution feeble. This, however, is of the future, while our subject lies with the present. Meantime, while private building enterprise is not likely to flag, the Dominion Government is not behind the age, its expenditure upon public buildings, for one of the recently-passed years, having reached the amount of 1,360,302 dols., or 272,061*l.* sterling. Large builders in good practice had, of course, better stay in London than go to Canada, but there are many smaller ones who could rely upon plenty of work at the outset, and sure profits. Much is to be done by a judicious combination of building and prospecting. A desirable locality is sure to grow in value, even without buildings upon it.

COUNTING THE COST.

Nothing is more hostile to the true and worthy development of the work of the artist or of the architect than any attempt to surprise people into the payment of a greater sum than they intended to pay for any commission which they put in hand. As far as regards the general prosperity of the tectonic professions, it matters very little whether such surprise is planned or is merely the result of slovenliness and want of due forethought. As regards the character of the professional men concerned, of course the difference is palpable. But this fact ought not to lead us to undervalue the mischief that may arise merely from our ordinary habit of taking things a bit at a time, without a thorough forecast of the whole.

This, we take it, is what is now raising no small amount of wrathful contention in the Court of Common Council. In December last, it appears from the discussion at the meeting of that body on the 7th of October, the Court approved of the project of erecting an architectural memorial on the site of Temple Bar, and the execution appears to have been entrusted to the City Lands Committee. If the Court of Common Council had taken the obvious precaution of naming a sum which they were prepared to sanction, and not to exceed, for the monument in question, all would have gone well. This must not be overlooked. Whatever blame may, rightly or wrongly, be attributed elsewhere, here was the point where due precaution ought to have been taken. It is not for the Common Council to ignore this fact.

The City Lands Committee, it seems, were not more careful in the matter than the Common Council had been. They were content with "a rough estimate," and do not appear, if we may judge from the otherwise conflicting statements of Mr. Bedford, their chairman, and Mr. Horace Jones, the City Architect, to have inquired whether the estimate for the building included the cost of the statues with which it was to be adorned. None of the items seem in themselves to be other than fair and reasonable. The sums of 1,250*l.* each for marble statues of her Majesty and H.R.H. the Prince of Wales are as little as could be offered by the first municipality in the world for such works. A thousand guineas for a griffin (presumably of bronze) is not more than a fair sculptor's charge, supposing the design to be one in all respects commendable. Nor is 300 guineas apiece for four bas-reliefs at all disproportionate. Here, then, we obtain the sum of 4,750*l.* Nor can it be contended that it is an overcharge for the work proposed. It is not quite evident to us how far these items, together with the cost of "about 3,000*l.* or 4,000*l.* for the remainder of the work," make up the sum of "about 10,000 guineas," but it seems tolerably clear, first, that if sculpture is to be introduced, it will not be worth the while of the City of London to pay less for it; and secondly, that it is in this question of the cost of sculpture that the misunderstanding has arisen.

Mr. Phillips gave notice of a motion tending to put a stop to the proceeding with the monument. A somewhat stormy discussion terminated by what we suppose must be taken as the vote of a majority of 75 to 51 in favour of the acceptance of the estimate. The notice of motion, no doubt, still stands, so that the subject cannot be considered as finally closed. Meantime, let us take the lesson to heart, that those who begin to build without fully counting the cost are proverbially likely to come to grief.

The daily press is tolerably accordant in condemning the erection of a monument on the site where such serious obstruction to traffic was so long caused by the old Bar—a survival, as it was, of times when carriages were few and far between. The proposal to form a refuge as a part of the monument is one that ought to receive support from the *Builder*, as the original proposer of these safeguards against the danger of the street. But it can hardly be doubted that the particular site is one where the necessary area of ground can be but ill-spared, whether for monument or for island. The public have not been allowed the opportunity of passing any opinion on the architectural merit of the design, and unless this prove to be in every way suitable, both for the locality and for the purpose of commemoration, it can hardly be doubted that a well-constructed subway would have been far more valued by pedestrians, if not by all frequenters of that great thoroughfare, than an edifice adorned by noble statues, and crested by a prodigious griffin. A dragon, by the bye, not a griffin, is the animal proper to the City arms.

THE SOCIAL SCIENCE CONGRESS IN EDINBURGH.

On other pages we give the substance of some of the papers read in the various sectional meetings of this, the twenty-fourth annual Congress of the National Association for the Promotion of Social Science, which opened on the 6th inst. In point of attendance, at any rate, the Congress appears to have been fairly successful, for by the afternoon of the second day (Thursday, the 7th) nearly 1,000 tickets had been sold, viz., 538 for members, 265 for associates, and 132 for ladies,—in all, 935. This total compares favourably with the 650 recorded at Manchester last year, as well as with the return of the Cheltenham meeting in 1878.

The usual meeting of working men was held, and was largely attended, although a small charge was made for admittance.

We shall give some additional reports hereafter. Dublin is fixed on as the next meeting-place.

THE QUESTION OF MASTER AND PUPILS IN ART.

SOCIAL SCIENCE ASSOCIATION.

In the Art Department, on the 8th inst., Mr. Hubert Herkomer, A.R.A., opened the discussion on the special question, "How far would the revival of the old system of 'master and pupils' be of advantage, and tend to promote the growth of historical art in the country, and the fitting use of painting and sculpture in our public buildings?" He had, he said, modified the title of his paper as follows:—"How far would the revival of the old system of 'master and pupils' be of advantage in the present day, and tend to promote the growth of true art?" Inquiring, first, how far the old system was advantageous, the writer remarked that the imitative faculties of the mind awaken early, and are the first to be exercised; reason and invention follow. It is thus that all art-workers have built their earliest efforts upon what has gone before them. When they have reached the point where originality begins to assert itself, they diverge into other channels—ripening, advancing, or varying the existing art, according to their powers of originality. History is replete with facts showing that all great souls had to shake off, and frequently with an effort, the influences of their masters, before they could do one single touch of that work that has made them immortal. This reflects seriously upon the system of tuition under consideration. Unless the student is led at the very beginning of his education to expect the final appearance of independent "mind-seeing" and interpretation of nature, he will aim little higher than imitating, not nature, but another man's interpretation of her. This individuality is the great mystery and secret of the art-mind. It cannot be transmitted to others, and cannot be stolen, for the best resemblance to another man's originality of style is but an imitation. The highest mental qualities, being originality and loftiness of invention, would appear last. Considering, then, that the qualities which are active at very early stages are the imitative, and bearing in mind that the system of masters and pupils exercises and encourages those qualities almost exclusively at first, it is not strange that those soul-given qualities, which are fixed for later development, should be lamentably impeded in their attempts to come to life. The system retards the growth of those qualities that make the painter renowned; that is one great flaw. Another danger attached to the system is that of the pupil being put under the wrong master, that is, under one antagonistic in all his ideas and aims to the innate but closely-hidden tastes of the student. Imagine the late Frederick Walker put under Maclise. Surely Walker, whose characteristic was to draw out the tenderest passages of nature, would have had the natural bent of his mind irritated and chafed. As it was, he was placed, with but little artificial tuition, under an engraver, and told to draw as much in the style of John Gilbert as possible. Then he had to draw on wood the sketches of Thackeray for his "Philip"—awful drawings—and Walker sorely wanted to try some original illustrations, instead of working out Thackeray's caricatures. He timidly suggested it, tried it, and at once showed, not traces of having imitated John Gilbert, but the originality that was in his mind. Now, this highly nervous, sensitive man, who never showed his work whilst in progress, even to the models who sat for him, and who would have been the last man in the world to have pupils around him, actually but unconsciously formed a school. From his life and works we can gather—first, that this painter would have done nothing greater (perhaps nothing so great) if he had been placed under a master; and secondly, that he would not have exercised a greater influence than he did by his works alone, if his studio had been full of pupils during his lifetime. After further illustrating the effect of a wrong selection of masters, the writer went on to remark that the works of great men have always had a greater influence upon young painters than personal tuition has had. The cleverness of drawing and so-called learnedness of French painters is as much due to the national character of the artists as to their school influences. In England we have certainly no strong school influences, but we have what is nowhere in the world so strongly developed, and that is originality and individuality of style. The French are as unhappy in their selection of subjects as they are certain of their drawing. It is their aim to strike, to startle, to fascinate. English art, however faulty it may be in precision of drawing, seems to take you by the hand and lead you to nature, and bid you love it,—to humanity, and bid you learn its lessons. This is a national characteristic produced spontaneously without any central impetus such as might accrue from the teachings of one man. What more do we want? Do we want more learning? Those who look for "learning" seem to be under an impression that it cannot be found in realism,—that to show any learning you must paint the Classic only. This is entirely erroneous, and is the cause of the word "learning" being misunderstood. Millais's head of Gladstone was full of profound learning, and so was his hastily-painted portrait of Mrs. Jopling. Learning comes with practice; originality never by practice, but it must be awakened by exercise. There is a danger in too early attempts at picture-painting; but this is only dangerous to the weak, and that only in case their first efforts are successful, so as to cause them to get into one groove, and work only for money. On the other hand, it is a significant fact that of those students who draw and paint such admirable studies from the life, and win gold medals, very few ever become eminent painters. Their mistake lies in simply doing what is placed before them, and in not being obliged to exercise originality, so as to make every study a picture. A master either forces the student into imitation of or similarity to his art; for in most cases the master allows the student to work upon his paintings, and the styles must meet. It is as difficult, however, to define the difference between similarity and imitation as it is to find the exact point where borrowing ends and stealing begins. If the pupil is to be a reflection of the master, the master must be unapproachable in his greatness, and there must be but one kind of art, and that his. We have yet to see the work of art that will positively satisfy all intelligent minds, and we have yet to find the master capable of training students of every variety of mind. Some sort of tuition or instruction is, of course, necessary; but its effect is only felt in the art of the time, when the highest grade studentship is paid much attention to. Good schools, with the best masters, might raise a higher level of art, but it is doubtful whether a higher level would produce more great men.

An interesting discussion followed; in the course of which Mr. Robert Herdman, R.S.A., said the subject which Mr. Herkomer had treated had been one of difficulty in all ages, and he suspected it was a question which would still go on undetermined for a very long time. He thought the question involved three points:—First, that of "master and pupil"; second, that of a school of historical art; and third, that relating to buildings. He thought the growth of a school of historical art would be promoted by giving far greater opportunities for artists to develop any faculty which they might possess in that direction. At present our art was mainly of a domestic character. If our municipal buildings and professional halls were more thrown open to the art energies of the country, he was hopeful that a strong effort would be made on the part of the professional artists to meet such a requirement, and art would have far greater influence in the country. Then, when the time arrived there would almost of necessity be a revival to some extent of the "master and pupil" system, because in such circumstances it would be impossible that any single artist could, unaided, carry out such works; and he believed the best thing for many of our younger students would be that, instead of following their own devices,—a course often leading simply to a restricted and rather useless mannerism,—they should be called in to assist in carrying out such important public works, where they could really give useful aid.

Mr. H. C. Boyes, speaking from his experience as an architect, contrasted the English and Continental systems of education in architecture. In England, he said, a young man was apprenticed to an architect, and learned from his master the technique of his profession. This was not the case abroad. On the Continent, the architect was trained, especially in Paris, more in schools and academies, and they saw the results in the architecture of England and France. In Paris they missed that originality observable in English architecture, which, of course, sometimes degenerated into vulgarity, but which always gave an air of picturesqueness and variety to our buildings. He thought the same thing applied to painting. We had in our painting in England very much greater variety and picturesqueness, though we had less of the French academical precision.

Mr. George Burnett, advocate, discussed the education of architects in this country and in France, and said he thought the result of the Continental system was that they had there a living school of architecture, which he did not think we had in this country. He knew of no building in Edinburgh, with, perhaps, one exception, which appeared to him to be designed as a natural result of the feeling of beauty in the artist, working upon the plan which was required by his employer and upon his materials.

The President (Professor Richmond) wound up the discussion. Touching in the outset of his remarks upon the question as to what should be the education of the student before his powers of selection had been formed, he pointed out, in the first place, that the technique of art was enormously difficult. The hand had to be trained to express what the eye saw or the mind conceived. Mr. Herkomer appeared to think that it was rather detrimental than otherwise for a young painter to be placed under a master with whom he did not entirely sympathise. With that he ventured to disagree. A student might have a great turn for form, and in that case the best master for him would probably be one whose strong point lay in colour, so that the student would have prominently brought before him that in which he was most deficient. He did not agree with the idea that learning was not necessary to art. By learning he meant knowledge of construction, and particularly of the construction of the human form. That knowledge could only be got by being taught intimately and in the studio of a man who was conversant with it. Then there were such things as laws relating to drapery, which, if known and understood, were of immense assistance to any painter. He could not see why both anatomy and those laws governing drapery,—simple enough things to learn,—should not be taught by a master to his pupil, and why that sort of teaching should not be of infinite value. In regard to wall-paintings, the art of the world, he remarked, had been done on walls, and he thought that was the sort of education that was necessary in England to enable men to paint on a large scale. Unless they got some system of art which would enable them to paint large subjects upon walls, he thought their art would degenerate into mere *genre* painting. As to the master and pupil question, it is clear that they could not create originality, but they could further it by educating students in such a workmanlike manner that, when it came to them to express themselves, they should be able to do so in clear language. They should know the grammar of their art, and if they possessed any originality it would come out. After alluding to the influence of allegorical painting, Mr. Richmond, reverting to the subject of education, said that what they wanted, after all, was to further the cause of art. They did not care how the education was got; they wanted the education. On the whole, he believed that they were inclined to think that the teaching gained under the direction of a master was better than that gained under the direction of an academy.

A SCHOOL OF DRAMATIC ART.

SOCIAL SCIENCE CONGRESS.

In the Department of Art, on its first day of meeting, Professor Richmond in the chair,

Professor Fleeming Jenkin, Edinburgh, submitted the first special question:—"Ought there to be a School of Dramatic Art, subsidised by private subscription or endowment, or by the State?" He began by apologising for appearing without his paper, which, he said, had been written and sent to London more than a week ago, and had not been returned. When asked to write about this question, he considered it his duty to go to Paris, with the object of ascertaining what was done there in the way of dramatic teaching at the Conservatoire. This he had done, and though he had not succeeded in being present when a lesson was given, inasmuch as the classes were not open, he had had the very great advantage of talking at considerable length on several occasions with two of the most distinguished teachers in the Conservatoire, and also with one of their most distinguished pupils. Proceeding to describe the method of examination, he pointed out that the jury consisted of twelve or thirteen men representing

the Government, letters, acting, and teaching,—a very efficient body to select the students who should attend the Conservatoire, and there receive gratuitous dramatic teaching. The French National Theatres and the Academy of Letters were essential parts of the system by which dramatic art was taught in France. He feared that, without support from analogous institutions in England, a mere Dramatic College would be barren in results. We could not transplant foreign institutions to our very different soil. The dramatic profession might, however, well consider whether it might not benefit by some such organisation as had been found advantageous in other professions. Almost every other profession had its professional society, and why should actors not have a Royal Dramatic Society? He thought that now the profession was in such a state that the public would accept such a proposal. The society might be founded with statutes, based partly on those of the Royal Academy, and partly on those of such professional associations as the Institution of Civil Engineers. It should be incorporated by Royal Charter, and placed under distinguished patronage by an honorary president of the highest rank. There should be two classes of corporate members. The higher class, of fellows, should consist of a fixed number of really distinguished men and women. The number should be so small as to make the distinction of belonging to that body as great as that of being a Royal Academician. In a profession there was nothing which conduced more to the advancement of the members than their directing their ambition into high channels, and there could be no better distinction with this end than that which was conferred by the profession itself. That was a very important point. There was no necessity for looking for patronage outside the profession. A profession itself could always confer its highest honours. So far, then, the society he suggested would be very closely copied from the Royal Academy. The second class, of associates, should be limited in number, but election even to this class should be so conducted as to make sure that to be an associate of the society would be a real distinction. The persons eligible as associates or fellows would be actors, actresses, and dramatic authors and musical composers whose works had been represented on the stage. No one unconnected professionally with the stage should be eligible, though a limited number of honorary members of marked distinction might be admitted. The intention should be that no actor should be admitted even as an associate who did not practise in what might be called the higher branches of the profession. It would be impossible by verbal distinction to secure this, but the following mode of election would effect the desired result. Each candidate should be recommended from personal knowledge by say three fellows and six associates, and a sketch of the qualifications should accompany the paper, stating definitely what parts the candidates had acted. This paper should be submitted to the Council, and unless the Council passed the candidate the election could not be proceeded with,—the election to be by all corporate members, and a certain number of "black balls" to exclude. A life composition should be paid on entry. The vacancies in the list of fellows should be filled up from the associates of a certain standing. Such a constitution would give a very much larger and more popular body than the Royal Academy, approaching more nearly to the Institution of Civil Engineers. What would be the functions of such a society? In the first place, it would be a fountain of honour. It could confer distinction on the most prominent members of the profession. To be president of such a body would be as laudable an ambition as to be president of the Royal Academy. It would encourage the ambitious and promising younger members by admitting them to its ranks. It could give valuable aid to students by holding competitions, awarding prizes, certificates, even scholarships. We should have a body representing the profession, whose decisions would command respect. We should have a substitute for the Société de la Comédie Française in many of their functions. Secondly, this Society would be a nucleus round which would gather many useful minor institutions. Thus it could administer grants and receive bequests. It could institute and manage benefit societies. It could institute reading libraries, portrait galleries, even a theatre itself could follow. It would be impossible for the fellows to avoid occasionally giving representations in which every part would be taken by a fellow, and these would be so successful that the national theatre would *grow*. The society would encourage the association between writer and actor so necessary to the stage, and would hold meetings at which every subject connected with the stage would be discussed. In a word, they should have an organised profession. Once grant the organisation, and the growth was sure to follow. The dramatic profession must teach itself, raise itself, honour itself, and in the present condition of the stage nothing was wanted to these ends except self-organisation, such as other professions had already adopted. He suggested that the Council might name a small, but distinguished, committee to promote the establishment of such a society as was described in the paper, if, after inquiry, they considered it possible and desirable.

Mr. Philip H. Rathbone, of Liverpool, said he had the very highest hopes of an organisation such as that sketched by Professor Jenkin. The principal difficulty would probably lie in the question as to who should be the first members of the association. Directly they had the association started, he agreed with Professor Jenkin nobody but those professionally connected with the stage should have one finger in the pie; but till it was started he was afraid the names of the first members must include a considerable proportion of outsiders. They knew the difficulty of starting any project when wrong men turned up, and had to be rejected. All that sort of invidiousness must be taken from the profession and placed upon outsiders, and the question arose, upon whom should it devolve? He thought it must devolve on some of those who had taken a great non-professional interest in the drama. Some of the very highest in the land had taken such an interest, and would be prepared to make the first list of members. He thought the idea of a Royal charter was an exceedingly happy one, and that Royal charter ought to name the first members. That done, he did not see the slightest difficulty in the members naming the associates. There was one very important class whom he should like to see much more numerous than it was at present,—that of managers who were not actors. There were very great disadvantages in having a manager who was also an actor, and he did not think they could have a good all-round company till they had as manager of that company a man who was precluded from appearing on the stage at all. He thought very great advantages would accrue from closer communication between the actor and the painter. In Germany the greatest mutual benefits had resulted from the actor and the painter working together in the question of grouping. He also alluded to the importance of the provincial theatres serving as preliminary schools for actors.

Mr. Robert Herdman, R.S.A., having referred to the power of the stage as a means of education and cultivation, and to the fact of its not being at present all that it might be, said that, believing something like what Professor Jenkin had put before them was likely to prove of service, he should certainly be very glad if at the present meeting of the Social Science Congress some step were taken by which the experiment might be made. He therefore moved that the Council be asked to appoint a committee to promote the establishment of a Royal Dramatic Society, if on inquiry they should consider this possible and desirable.

The Rev. William Vincent, Norwich, seconded this proposition. He had listened with interest to the very able address which had been given by Professor Fleeming Jenkin, and he thought it would be a great pity were any movement such as this to fall to the ground for want of being definitely taken up. He looked upon the stage as a very important element indeed in the education of the people, as well as in their recreation, and he thought it was a very great pity that any country like ours should be in the position of not being able to recommend the stage as a means of intellectual enjoyment for all classes of the people. It seemed to him that a very great step would have been taken towards their being able to recommend it, and set it forward as an educational and moral educator, when it was put upon some more satisfactory basis than at present. Having seen the great difficulties that there were to any national recognition of the stage, he thought it was desirable that what seemed to him the most practicable way suggested by Professor Jenkin should have a trial.

The resolution was put to the meeting and carried unanimously.

Mr. H. C. Boyes read a paper by Mr. Bogg on "Dramatic Art and the Dramatic Reform Association"; Mr. Rathbone one by Mr. A. G. Symonds on "Dramatic Reform"; and Mr. Archibald Constable a paper by Mr. Charles Rowley, jun., on "Remedies for Staginess."

ON THE RELATION OF ART TO SOCIAL SCIENCE.*

Holding the office of President of the Art Section of this Congress, I feel in a position of some difficulty and responsibility. Difficulty, because this office has been filled with great ability in previous years, and much has been said of useful wisdom by my predecessors in this chair, and little new can be said concerning purely high-art questions. Responsibility, from the natural feeling lest any words of mine should hinder rather than help the cause of art, and the considerations concerning it which are taking place. It would ill become me to delay the important business upon which we are called together by expressions of personal feelings. But I may express my sense of the honour done to the position I hold at Oxford, by my being invited to take the President's chair at this meeting.

After somewhat careful thought, it has appeared to me that more good may be gotten from an address in this Social Science gathering, dealing with art from a social point of view, rather than with art from its very highest standpoint. Further, being called upon to lecture at Oxford upon the "History and Philosophy of the Fine Arts," it will be a rather pleasant change to address you upon matters of great importance (as they appear to me) relating to the existence or non-existence of the chances of art progress in the United Kingdom. And by that progress I do not mean alone the increased power shown in the painting of pictures, in the making of statues, in the building of cathedrals; but rather I would ask whether, taken generally, art, or the love of the beautiful, is getting to have any firmer grip upon the minds and lives of all classes,—that is, whether the necessity for being the possessor of a beautiful object rather than an ugly object is gaining ground? And if not, what are the chief impediments to the growth of refined tastes among the middle and lower classes? The driest philosopher, or the stiffest-necked utilitarian, will no longer now fail to give art an important place among the necessities of civilised existence. We certainly have an advantage in living in an age of reformation; in an age of freedom of speech, of intellectual growth, of courageous attitude against vices, narrowness, and pedantic usages of all kinds. There is a general desire for improvement among all classes, and a growing wish to cultivate taste. All this must be acknowledged, and yet we are far, very far, indeed, from being an artistic nation. South Kensington's vast machinery for art education, together with its beautiful collection of ancient and Mediæval art, has done something, indeed, to civilise design, and to educate designers into something of more reasonable artists than those who, previously to the Exhibition of 1851, exhibited the lowest corruption of taste. Our National Gallery in the great metropolis has, within comparatively few years, become one of the noblest collections of pictures in Europe. The great towns, Manchester and Liverpool, yearly open an exhibition of pictures, and there are signs in both cities of a desire for monumental art, a desire that the bare walls of their buildings should be decorated with mural paintings.

This great city has its Royal Academy of Arts, among whose members may be found not only distinguished painters belonging to its own nationality, but others, foreigners in blood, but brothers in art. The Universities of Oxford, Cambridge, London, and, as I am informed also, Edinburgh, have, within but a few years, recognised the importance of art as a branch of education by accepting bequests to form art professorships. The Grosvenor Gallery, through the noble enterprise of a single gentleman whose name is well known here, whose name can only be heard with respect by every artist, Sir Coutts Lindsay, has given to the public the chance of seeing a class of pictures long denied to it by

* By Professor W. B. Richmond, M.A., read as President of the Art Department at the Social Science Congress, October 11th.

the persistent non-recognition of their value by the Royal Academy of London. All this looks like vitality, and no doubt does prove a growing interest in art. But we must remember that these museums, these exhibitions, and these lecture-rooms, are visited by a comparatively small class of people; that the very heart of the population, standing mostly in need of æsthetic culture, or of its refining influences, is yet untouched by art; and that outside those whose appetite for what is lovely can be satisfied, there is a hungry crowd which would be satisfied too if it had the means, and were not dragged down into the slough of bad taste by daily influences acting unconsciously upon the minds of it. The vast strides of science, the rapid accumulation of wealth, railways, telegraphs, have created needs to be realised quickly. New towns have sprung up like magic. Old towns have been pulled about without regard to the historical or artistic treasures contained in them; the ruthless reign of iron has prevailed, the unfeeling hand of destruction has satisfied its lust, well nigh, let us hope. The reaction has come. But where are we?

Something worse almost than pulling down our churches has taken place. Restoration has caused even more ruin than the progress of railways. Many of the most interesting and beautiful creations in architecture have been swept away, and this done in no spirit of destruction, but with the mistaken idea that it is possible to restore old work at all: with the idea, too, that neatness and mechanical exactness will not only serve in the place of spontaneity of design, but that it is in point of fact superior and more desirable to it. If one-tenth part of that money spent in so-called restoration had been expended in preserving, by the simple means of adding a buttress to a weak wall or tower, or by strong oak timbers, unplaned, where the roof was weak, or by such-like structural repairs, monuments of the love and skill of those in bygone times, whose simplicity of life rendered simple their faith and ideas, would still remain to us, in the place of what may be called pious frauds. It was with a view to check the headlong and heedless rush of the restoration mania that the Society for the Protection of Ancient Buildings was brought into being. Late in the day through this admirable society has come (too late, indeed, to save much beautiful work from destruction), through the energy of its workers and the enthusiasm and courage displayed by its secretary, Mr. Morris, old work has been protected and respected under the advice of the society; and out of our own country, in Italy and France, the influence of the salutary example set by the Ancient Buildings Protection Society has borne fruit. The mother church of Western Europe, St. Mark's, at Venice, was threatened with destruction, — that noble façade, the labour of the twelfth, thirteenth, and fourteenth centuries, was to be pulled down and rebuilt. Through the exertions of the Ancient Buildings Society such a memorial was drawn up, signed, and sent to Italy, and by reason of the number of its signatures, and the importance of them, we cannot but hope and believe that it has brought the lovers of art in Italy to consider again before they withhold their words of expostulation at a project which would rid the world of one of its greatest treasures.

I have ventured to make use of the term "pious fraud." Restoration pretends at best to be what it is not, and never can be; it pretends to restore work to its pristine beauty, it gives new lamps for old ones, and, as in the ancient story, the new lamps are found to have no virtue in them. The magic of old work disappears under the hand of the modern workman, for the conditions under which the eleventh-century carver and the nineteenth-century carver have worked are so totally at variance that their labours cannot for a moment bear comparison, and it is out of all question that the modern work of to-day can have one iota of the spirit of the ancient work. Therefore, restoration has in it the nature of a deception, and must be most misguiding to those very classes whose correct and chaste taste we must be desiring to cultivate.

Architecture is such a generally necessary art to all, it enters into the wants of every-day life, that it should be, and is, one of the chiefest factors in art cultivation, and hence it can be made to retard or advance the progress of general artistic tastes. So that the placing of new and cold workmanship in the place of old, truly artistic and loving work is defrauding a very large class of people indeed, rich and poor, of the refining influences of superior and nobler work.

The very rapid and easy means of communication by railway and telegraph have in great measure broken down those local characteristics, both in architecture and manners, so interesting in older England. A general, very natural, and to be applauded desire towards greater equality among classes, brought about by modern facilities for their coming daily more and more into contact, has acted in making the lower class ape the appearance of wealth and show of the class just above it. So that, instead of being content with real stability, it demands ornament in its dwelling-place, in its furniture, in its costume. Hence vulgarity, bad work, bad building, bad design, and in the end a tumble-down and demoralising appearance of rottenness or flimsy raggedness. Few sights can be said to be more depressing than the ill-built, stuccoed labourer's house now erected in a village street, mean to the last extent, be it understood, having no inch of good work or interest about it. Sad is its cold slate roof, indeed, in contrast to the old thatch, cool in summer and warm in winter. Melancholy the contrast between its bad bricks and the oak timbers, joined and well mortised, which had stood often the wear and tear of centuries in an old cottage. The taste of the inhabitant of the senseless edifice is lowered. Rarely do we find the same sign of care taken over his cottage garden, the same pride in his creepers of roses or grapes, as was visible in his more primitive dwelling. Yes, very naturally the man, though poor, is influenced by the vulgar want of association, and his pride, in his unsympathetic dwelling, of the comeliness of its surroundings, is ground out of him by it; he becomes vulgar, no longer simple, liking his imitation and really comfortless house because it has window-sashes like the squire's house, and he deceives himself into the thought that so he is a bit higher in the social scale. This instance is only at the confines of the general ostentation which is the product of modern civilisation, and can only be checked by the energy of art.

Checked by those who have taste, and who have a right to speak, saying without fear and in perfect faith in their own convictions, that where the heart is not simple, where there exists a grasping for another's social place, there will exist neither beauty nor morals. It is admitted, of course, that the old will not last for ever, that new cottages must be built; but let them, these new ones, at least be built (in an age boasting of its superior science and superior facilities) as well, and as lastingly, as the old were built. It comes to this really in the long run, that those who desire their dwellings, their clothes, or their furniture, to appear more costly than they really are, are the true delinquents. These are they who pervert taste. Solid stone or brick walls, well roofed, the strongest and simplest furniture, without the overlay of cheap and bad ornament, woollen or linen unadorned garments, will never be vulgar. If this fact could only be made clear to the minds of most of us, a better style, both in house building and house furnishing and dressing, would come about. From a clearly practical point of view, it is so evident that although the first outlay may be greater in building, furnishing, dressing in a solid or simple manner, repairs so expensive and constant need be but rare, and, too, that mental demoralisation where repair cannot be afforded, caused by the rapid decay of showy but bad work, will be avoided.

No one will deny the moral influence exercised, even unconsciously, upon the whole human race, and, too, even upon animals, by the nature of their daily and hourly surroundings from earliest years. That this influence may be good or bad, in morals and æsthetics, needs no words from me.

Now, believing this, and being anxious for that large lower class which composes our labourers, agricultural and others, more especially for the sake of those who will exercise themselves in any craft, such as building, carving, carpentering, cabinet-making, what can we do during the few early years of their education which might guide their tastes in a good direction? And further, what agencies are there at work in the general surroundings of our great cities which tend to degrade rather than to elevate the love for what is beautiful and refined?

I take it for granted that those who are here to-day are interested in art, and that there will be found no one who will say that any child will be less fitted in after-life to perform the simple duties of an artisan or labourer who has been led by daily contact with beautiful objects to prefer them to ugly objects. And though I quite think there are none here who believe that dulness is moral, joy immoral, ugliness chaste, beauty unchaste; yet (though chiefly exploded) this theory has not been without its votaries among excellent though misguided moralists. Now, science has provided us with a means in photography, cheap, and by recent discoveries permanent, by which at small cost any quantity of reproductions of noble works of art in all its branches may be obtained.

I have mentioned that there is a very large class which, through various causes, either from want of desire brought about by faulty early education, or want of means, from overwork, or want of holidays, do not make use of the advantages possible to it of visiting museums, galleries of pictures, or attending lectures upon subjects of æsthetic import. This being so, are there no means by which this present failing may be made up to the next generation? I think there may be.

Since the Education Act has been brought into full play in England, a chance offers itself to get at the very class we want to touch and educate to love what is beautiful and refined; and, as I venture to think, this class would be vastly improved, even morally, by early contact with beautiful objects.

No doubt many here have observed in their passages through picture-galleries, as I have, that the very poorest, those in rags and tatters, are often found rapt in admiration before early Italian pictures, and especially before those of a religious character. This fact has been most noticeable to me in the National Gallery of London. And when we come to think of it, it is reasonable that this should be so. The direct simplicity and reverential treatment of the early pictures has a charm to natures ignorant, perhaps idle, perhaps dissolute, concerning which there is no reasoning; but that bright spark of human feeling, wellnigh, perchance, snuffed out by the degradation of surroundings, is rekindled by its contact with the fire of pure love ablaze in early religious art. So that we must admit the possibility of touching the sensibilities and the nobler emotions of those in the lowest scale of life by the elevating influences of art. Photography being the cheapest and most exact means at hand for the purpose, I would suggest that our Board schools, each and every one of them, and our parish and Sunday schools too, should, under wise guidance of a committee of taste, provide themselves with photographs of fine works of art. And these should not be confined to reproductions from pictures only, but should include architectural details, furniture, patterns, and designs of all sorts. And further, I would have casts from fine carvings, which can be purchased at such a moderate rate as few are aware of; these, with the photographs, should be hung in order upon the schoolroom walls. Every child who can learn to write, one would think, could learn to draw, up to a point to be of great service in after life. Think of the numbers and numbers of artisans who in the departments scattered over the country under the supervision of the Art Department at South Kensington, whose rough and hard-worked hands during the day handle the pick-axe, or trowel, or even spade, endeavour in the evenings to train themselves by tracing the delicate curves of a Greek honeysuckle carved on a stele, or by copying the fanciful ornament designed in years gone by by a Gothic workman. No better was he than these present workmen are, only, having lived in a more artistic and vital atmosphere, his art had life and meaning in it.

What difficulties to such as these artisans are would have been overcome, if in early life, while yet supple, as not yet rendered stiff and difficult of command by the daily exercise of rough work in order to exist, their hands had been cultivated, even up to a limited point of control and sensitive delicacy of touch. And if, at the same time that the young hands are learning, the impressionable youthful mind be cultivated through the eye to dwell upon beautiful objects, what a seed of profit and delight is sown. Of course, it is easy enough to see that there would be many failures attendant upon such a scheme, and a pessimist may say, "Ah, yes! but what good would come out of such superrefinements? You are only training a side of the mind which will never be brought into play in after-life; you will only make your people discontented with their lot in life, and

unwilling to fulfil its drudgeries." But the answer to all this is, "You are only presupposing a result upon a scheme not yet tried; you are only begging the question in stating that cultivated instincts towards refinements weaken self-control and the exercise of severer duties." Further, by teaching children of the artisan class to draw, you are furthering them with advantage in the pursuits that may be in store for them in after-life, and by accustoming their young eyes to dwell upon beautiful design, you are stimulating a faculty where it exists, though latent, perhaps. Again, morally, by teaching the elements of drawing, you put amusement within reach by which spare hours may be enriched, time employed otherwise spent in the tavern.

Healthful amusements, occupations for the eye and hand, are enemies of vice, and the strong armour of probity.*

THE HEALTH DEPARTMENT AT THE EDINBURGH CONGRESS.

SOCIAL SCIENCE ASSOCIATION.

On the 7th inst. the special question for discussion was: "What are the best areas for sanitary purposes, and how far should there be a revision of the mode of electing and continuing the services of the officers under the Public Health Acts?"

Several papers bearing upon it were read, and there was a discussion, in which a number of gentlemen took part.† A general opinion was expressed as to the failure of sanitary action in Scotland, and that an amended Health Act was necessary.

Mr. Greig, inspector of the city parish, Edinburgh, quite concurred in the call for extension of areas for local sanitary authorities. He thought that parochial boards were now very much hampered by the narrowness of the localities they had to deal with, and the objections of the ratepayers to incurring any heavy expense. He thought, at the same time, that the constitution of the parochial boards required improvement, and that an extended area was required as much for Poor-law as well as sanitary administration. He would not, however, increase the number of boards. He thought, rather, that local boards should be consolidated.

Mr. H. H. Collins, hon. secretary of the Department, said he had carefully read over the Edinburgh Act, and he could not understand how, if that Act were carried out in its integrity, and it was not obstructed more than it was in human nature to obstruct, it should fail to prove satisfactory. With it the inhabitants of Edinburgh would be protected, in the question of public health, in a way which no other city in the United Kingdom was at the present moment protected. In that book they had the Bible of public health. Their Act, in fact, should serve as a model for them in other parts of the United Kingdom in their efforts to lower the death-rate, and in that way to lower all the other rates to which they were subject.

Mr. G. W. Hastings, M.P., president of the Council, pointed out that the recommendation of the Royal Commissioners in favour of the adoption of the union as the rural sanitary area, on which the last Public Health Act was framed, had been carried only by a majority of one. The minority had been in favour of the county as the sanitary area. Now, the result of adopting the union had been to make it impossible for rural sanitary authorities to pay their medical officers salaries which could, under any circumstances, induce them to give up private practice and devote themselves to sanitary work. In his opinion, it was a fatal error to cause a medical officer of health to engage in private practice; first, because sanitary functions at the present day were such as demanded not only all the time, but also all the thought and energy of the medical officer who undertook them; and, second, because very often his duties as a public officer conflicted with his own private interests in the pursuit of his own private practice. Accordingly, this adoption of the union as the sanitary area was one of the first things which the Legislature should undo. Even if no other thing were done, this alone would be productive of great good. In his own county of Worcester they had ten rural unions, and, between them and the small burghs, from 800*l.* to 1,000*l.* could easily be paid to one skilled and efficient medical officer, who could do the whole sanitary work of the county.

On the 8th, the special question for discussion was, "What is the best mode of amending the present laws with reference to existing buildings, and also of improving their sanitary condition, so as to render them more healthy, having due regard to economical considerations?"

Councillor Gowans, Edinburgh, opened the discussion. There were, he submitted, radical flaws in our present system of regulating the erection of buildings. The Public Health Act of 1867 was a step in the right direction, but it was intended chiefly to apply to small towns, and was largely permissive; therefore, one community might observe proper precautions, while another was permitted totally to neglect them. Hitherto advances in sanitary science had almost invariably been the result, not of precaution, but of the scare from time to time produced by some frightful visitation of contagious disease. Progress, therefore, had necessarily been spasmodic and unsatisfactory. At the present day the conditions of sanitary well-being were becoming better understood; and he submitted that the following reforms should be given effect to:—(1) There should be drawn up a code of public law on the subject of health applicable to the United Kingdom, and compulsory throughout. (2) There should be appointed a Minister of State for Public Health, with a seat in the Cabinet, to whom local authorities should be directly responsible for due administration of the law. And (3) that no person other than an architect, educated, examined, and qualified as a lawyer or a doctor now was, and under a corresponding responsibility, should be permitted to submit plans to a court. Whilst economical considerations must not be overlooked, they must not be, as at present they were, nearly the main consideration; and Parliament ought to step in and enact that no mere money considerations should interfere to prevent proper sanitary appliances for the preservation of the public health.

Professor Fleeming Jenkin, Edinburgh, read a paper giving an account of the Sanitary Protection Association, founded at the suggestion of the writer in the spring of 1878, to effect the objects indicated as desirable in the question before the Congress. In consideration of an annual payment,—usually of a guinea,—the member obtained:—1st, a report on the condition of his house; 2nd, inspection of alterations made; 3rd, an annual experimental test of the condition of the drainage system. The society was a mutual benefit society, closely analogous to steam-boiler associations. The association numbered about 500 members, and had worked smoothly and effectively.

Sir Robert Christison supplemented Professor Fleeming Jenkin's paper by stating, as president of the association, that the inception and successful results of the association were due to the Professor. He had large experience of the great good which the association had already done. His only surprise was that, instead of their now having 500 subscribers in Edinburgh, they should not have 5,000. Referring to the new Edinburgh Municipal Act, he said the proprietors of buildings might erect buildings one-half higher than the width of the street in which they were built. It was a gross error to allow any street to be so constructed. It ought to be the very reverse.

Dr. Wallace, Greenock, stated that in Greenock many of his suggested improvements were defeated by the action of the Dean of Guild Court, which, he was sorry to say, was too largely made up of speculative builders. But he hoped, as the result of recent action in the town, the Local Authority would be enabled to see that the houses to be erected on certain vacant pieces of ground would be built in conformity with proper sanitary requirements.

Dr. Alexander Wood, Edinburgh, thought, with regard to Councillor Gowans's proposal to secure better-educated architects, that was not what was wanted; but what was wanted was a provision that, when an architect, from carelessness, or something worse than carelessness, built unhealthy and dangerous houses, he should be amenable to be punished by law. The question they had to answer was this,—Were they to allow the poorer classes to remain in houses that generate vice? When a house was unsanitary, it should be pulled down and got rid of. But the work of meeting this evil would not be done by Parliament. It must be done through a philanthropic movement among such of the upper classes as were willing to give their money to the removal of the people from these houses.

Mr. H. H. Collins pointed out that in London they had what Councillor Gowans desired in the way of the better education of the architects, in the shape of the Institute of British Architects, whose certificate was necessary to the appointment of district surveyor, which he himself held.

Sir John Rose Cormack, Paris, remarked that sanitary and domestic architecture were in Edinburgh, and in Great Britain generally, very much in advance of their state in Paris. In fact, all that he could say of them in Paris was, that they were deplorably bad from our point of view,—bad for health and bad for morals. They were nevertheless, deserving of study, as they showed the natural outcome of the evils against what sanitarians were in this country raising a warning voice. In all our large towns the increase of value in property had a dangerous tendency to lower the health-standard of the inhabitants. Even in Edinburgh there was reason to fear that buildings were becoming too much crowded together; the back greens in the new town, Sir John believed, were in danger, which was much to be regretted, as they were, as open spaces, invaluable to the public health. Sir John said that in Paris it is not difficult to point to architectural peculiarities, and social arrangements contingent on these peculiarities, which perpetuate *foci* of infection, and disseminate contagious diseases. The stranger admires the Avenue de l'Opéra and other spacious avenues, with their tree-adorned cleanly-swept pavements, the carefully-watered dustless roadways, and the stately houses. But let him take a back view, and he would turn away in disgust. The building plan which has been followed with wearisome sameness prevents the possibility of cross ventilation. Light and air are excluded. The windows at the back are hemmed in by lofty side walls. Then, again, the servants of each family living on the different flats are crammed into the top story, where they form a population by themselves, in constant communication with the worst slums of the town. This is the plague-spot of Paris. Walking one day in one of the superb streets now adverted to, a French friend truly remarked to Sir John that each fifth floor was a *foyer de perdition*—a hotbed of moral and physical pollution. This architectural peculiarity of Paris, Sir John said, was a thousand times more demoralising than the much-reprobated "bothy system" of agricultural Scotland. Sir John went on to show why typhoid fever and diphtheria were becoming more and more endemic in Paris. He also said that the suppression of cesspools now being carried out was fraught with danger, for the house supply of water was inadequate to the flushing, and the plumber work and masonry were imperfect.

Mr. Allan Carter, C.E., pointed out that an architect was expected not only to know all kinds of sciences, but also to be able to charm his clients out of all opposition, whether that were financial or prejudicial. There was, notwithstanding these difficulties, a very large number of architects in Edinburgh who were thoroughly competent both as artists and as practical men.

The President (Dr. Beddoe) in summing up the result of the discussion, said that in England about 64,000*l.* a year was paid to medical officers of health, besides various amounts paid by various districts who did not accept Government aid. That sum, if judiciously divided, should provide the services of a sufficient number of competent medical men, who should give their entire time to the work. It was worthy of notice that in the last few years the mortality in the seven large towns was considerably less than that in the towns next below them.

Professor Fraser moved, and Councillor Gowans seconded the motion,—"That the meeting strongly recommends that the Council shall consider the question of the sanitary rural areas of Scotland, with a view to an amendment of the law by their extension," and it was unanimously adopted.

On the 9th Dr. Beddoe delivered

THE PRESIDENTIAL ADDRESS.

We are compelled to restrict ourselves to a few of the more salient paragraphs:—

"The subject of modern houses for the working classes—how they are built, and how they

* The remainder in our next.

† We recommend those who are interested to see the *Scotsman*, in which journal, day by day, full and careful reports have been given.

ought to be—has frequently been debated in this section, and would furnish material for a dozen addresses such as mine. I will make but two or three remarks on it in passing. Landlords, whether from philanthropy and a sense of duty, or influenced by public opinion, have done much to improve the dwellings on their estates, and speculative builders have, to some extent, been coerced by building Acts and bye-laws; but I do not think the improvement is so great as is usually supposed. If it were, one would expect to see a decided improvement in the death-rate from phthisis, from pulmonary diseases, and from rheumatism; for warmth, dryness, and proper ventilation ought to act favourably upon all these; whereas, in fact, if phthisis has decreased, other pulmonary diseases have quite made up the difference; and there is no improvement in rheumatism. I should say that, as a rule, the requirements of decency are more studied than they used to be, and that, perhaps, dryness of site and foundation is more looked to; moreover, by the persistent action of medical men and sanitarians, including many names well known in this section, so much has been done for water supply and sewerage, and disposal of refuse, that the great scourge of enteric fever is being gradually abated; but thin walls, bad mortar, and flimsy roofing cannot make warm and dry houses. One curious and unexpected result of building improved cottages has been brought to my notice. I am informed that in a certain Highland district where the proprietors have exerted themselves to build decent and air-tight dwellings for their small tenants, crofters, and labourers, instead of any improvement in health following, consumption, formerly uncommon, became very rife and deadly. Similarly, the natives of New Zealand, though their ordinary mode of lodging is about as ill-contrived and unwholesome as can be conceived, are said to suffer in health, and specifically to become more phthisical, when they take to living in houses of the European pattern. In the case of the Highlanders it is probably want of ventilation which is the fault of the new and comfortable houses. On the whole, it would probably be well to adapt to cottage-building the primary rule of British politics, correcting the evils of the local type of dwelling, whatever it may be, rather than seeking to introduce an entirely new one. The present Earl of Derby, in an address delivered to this association several years ago, recommended that the difficulty put in the way of constructing workmen's dwellings in towns by the exorbitant price of sites should be met by increasing the vertical elevation of the buildings. And we see that the elevation of buildings is constantly being increased, though not so much in the case of workmen's dwellings as of upper class houses, hotels, and warehouses. The change is not one to be commended. A street 50 ft. wide, with houses 80 ft. high, is scarcely more pervious to sun and wind than a lane of 20 ft., with houses of 32 ft. The population on the same area will probably be about the same; and Dr. Farr has shown us that, *cæteris paribus*, the rate of mortality increases as the density of population. Lofty staircases tell unfavourably on the health of those who frequently ascend them; hence the anæmia and functional affections of the heart which are the plague of London housemaids. And there are other evils connected with over-lofty houses well known to the citizens of 'Auld Reekie.' . . . . As for dwellings, though the multiplying of enactments is bad, and the multiplying of officials is worse, increasing expense and making openings for jobbery, I am disposed to favour a moderate extension of legislation, especially in the direction of prohibition of what is certainly known to be mischievous or unsafe. Thus it seems monstrous that men should be allowed to build new houses within ordinary flood-mark, as has been done in hundreds of cases within my own knowledge of late years. There are other offences against the laws of nature which are so clearly proved to be such that they are almost criminal, such as carrying a soil-pipe under a house, or placing a water-closet in the middle of it, neglecting to trap a main-drain, and so forth. Surely the perpetrator of these things ought to be held responsible in purse or in person. When an overworked or muddle-headed signalman or pointsman commits a blunder which has fatal consequences, he is amenable to the criminal law; much more should the artisan be so who by scamping his work brings death into an unsuspecting household. I cannot agree with those who say that the public, the house-tenants, are generally indifferent to these things, because they avoid putting themselves to an expense they can often but ill afford in investigating their house-drains for the sake of a doubtful benefit. I should say that among the upper and middle classes at least there is a great though vague horror of 'bad drains,' but they have not usually the skill nor the power to protect themselves, the mason's and plumber's work, good or bad, being covered up or concealed. Few principles in building seem to me more valuable than this,—that the whole work connected with the drainage of a house, sinks, soil-pipes, ejects, and so forth, should be so placed as to be readily inspected and investigated. Meanwhile, as the public are incompetent to protect themselves, it seems to me that the liberty of builders and plumbers to do mischief should be closely restricted."

THE WRECK OF THE SCOTCH EXPRESS.

Railway collisions are becoming a stock-entry in the weekly journals,—not to say in the daily papers. The subject is assuming a magnitude that demands special treatment, rather than such space as can be spared from columns like our own. But there is one lesson which, in our opinion, has been loudly proclaimed by disaster after disaster of late; that is, that we have been too much in the habit of looking to mechanical instead of to moral safeguards. So strongly was the danger of this temptation felt by some of our earliest and most experienced engineers, that they set their faces, perhaps with too much prejudice, against anything like automatic appliances on a railway. This, no doubt, is erring in one direction, but it is quite as unsafe to err in the other, and to throw on any real or imagined scheme for the perfecting of mechanical appliances the responsibility which really depends on the human agent.

With regard to the latter, the obvious importance of adequate pay, limited hours of work, provision for old age and illness, and pecuniary interest, to some small extent, in the safety and in the profit of the working of the establishment, is not less than that of perfect discipline, clear regulations, duly apportioned responsibility, and sure punishment for neglect or breach of order. To that the experience of the wreck of the Scotch express near Leicester, on the 9th of October, teaches us to add uniformity of occupation. In such matters as the working of signals, or the driving of an engine, where a man has one thing to do, which he has done, and done well, for a long time, there is a certain danger incurred by setting him to do something else. Thus Hill, the driver of the wrecked train, is a man of good conduct, long experience, and high character. But on the night in question he was driving an engine of a different construction from his own; and to that fact his overlooking the condition of the gear is no doubt primarily to be attributed. This is a very serious warning to railway managers, as to the distribution and employment of even their best men.

Even more serious than the question of personal responsibility is that of volume of traffic. Looking back to the very commencement of the railway system, we find that this subject has occupied the anxious thought of the fathers of the English railways. How much revenue can be earned from a track of rails with safety is a question that has never been duly investigated. Intervals of ten minutes between following trains were at one time thought to be indispensable. But on the Metropolitan Railway, in 1874, 193 trains left the Moorgate Station, on one line of rails, in every day of eighteen hours, so that the succeeding despatches were only five minutes apart. This enormous traffic, which earned in 1878 38,600*l.* per mile per annum, is carried on safely, because the trains all run at one speed. The moment difference of speed for different trains is introduced, a source of danger springs up; the effects of which, on the one hand, reduce earning power, and, on the other hand, render the avoidance of collisions almost impossible. The London and North-Western, the Great Northern, and the Midland Railways together, have twelve tracks of rail for more than twenty miles out of London. With all these twelve, carrying a traffic that varies in speed from twelve to fifty-four miles an hour, they earn a gross revenue per mile of their aggregate course of less than half that earned on the two tracks of the Metropolitan. And carefully managed as these three great lines are, we find that, in 1878, twenty-six reported accidents to passenger-trains occurred upon them, that being the safest year on record. Thus it is incontestable that the introduction of different speeds on the same railway at the same time limits the earning capacity of the line, and increases the liability to collision to an enormous amount. This is the problem we now have to face, and we only wish that we saw any good reason for concluding that we have come to the close of the chapter of disasters for 1880.

CAST-IRON WATER-TANKS.

It is not very creditable to the constructive skill of English engineering that so many cast-iron water-tanks should have been destroyed by failures, the side plates having been ruptured. In all the cases the failure has been attributed to the inner tie-bolts having given way through rusting at the point of connexion, or the cast-iron "snug" has broken, or the tie-nuts have been too few or imperfectly placed, and too weak. A few plain and short rules may probably prevent, or tend to prevent, such failures in future. "Accidental" failures they are not, but constructive blunders. Cast iron is used for railway-station tanks; but these are not, as a rule, very deep, seldom exceeding 6 ft. in depth, 5 ft. of water, and it is in vertical depth that there is danger. Cast iron is used for tanks in preference to wrought iron, because it endures longer under exposure.

As to the rules. The pressure of water against the sides and ends of a tank is in proportion to the vertical depth of the water, and without going into nice calculations, may, for safety, be roughly taken as ½ lb. per square inch for each foot of depth. A tank to hold 10 ft. in depth of water may therefore be assumed to have a pressure against the sides equal to the full pressure at half the depth, or, say, 2½ lb. on the square inch.

For tie-rods.—The best wrought-iron bears a breaking strain equal to 25 tons on the square inch, but it will not be safe to use more than 5 tons of this assumed strength.

The whole of the support to the sides and ends of the tank (in large tanks) should be assumed to be given by the inner stay-rods, the strength of the tank-plates not being noticed.

In a tank to hold 10 ft. in depth of water safely, there should be two tiers of tie-rods. The lower tier, 3 ft. 6 in. from the bottom of the tank; the upper tier, 7 ft. The top of the tank will be tied by the roof-timbers.

The tie-rods must not be allowed to swag, and so strain themselves and the tank, but must be supported by vertical supports inside the tank.

Every tie-rod must go through the tank-plates at right angles, and be secured to a large outside washer, say from 1 ft. 6 in. to 2 ft. square, and the screw-threads at the inner couplings must not weaken the tie-bolt, but be forged, so as to leave the full strength of the tie-rod.

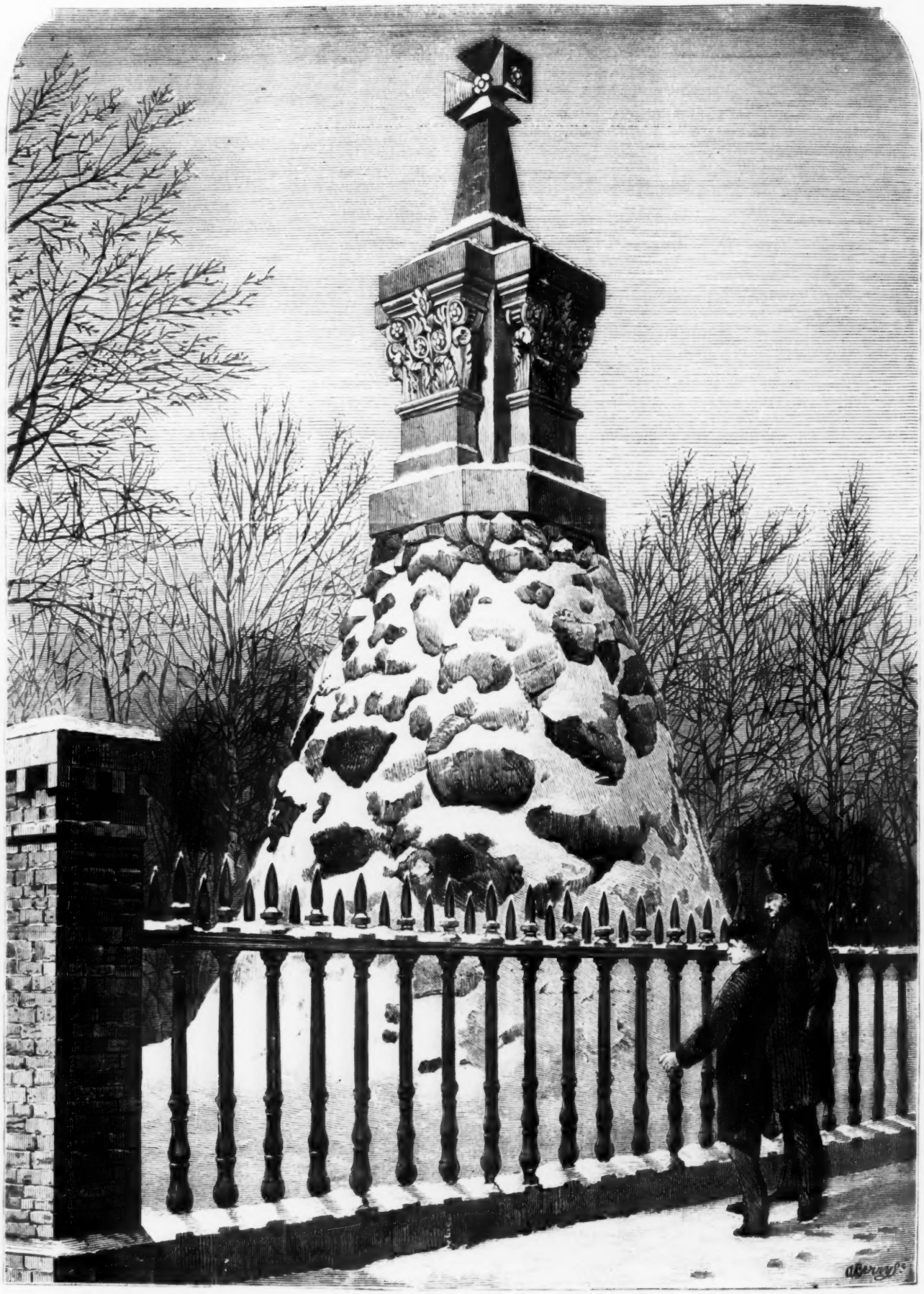
There must be no diagonal ties, but each tie must have a direct pull, not on the tank-plate, or upon inside brackets, or cast snugs, but on the outside washers. A tank so constructed and so stayed will not burst. It is assumed that the bottom of the tank will be securely supported; the pressure on the bottom plates of a 10-ft.-deep tank may be taken as 5 lb. per square inch.

It will not be desirable to construct elevated cast-iron tanks much deeper than 12 ft., as it will be safer to increase the area rather than the depth. Cast-iron will, of course, bear a very much greater strain than 10 ft. head of water; but there would be a complication of tier-above-tier of tie-rods, and in filling and emptying the sides of the tank would expand and contract unless the tie-bolts were cottared or screwed up tight, and maintained tight.

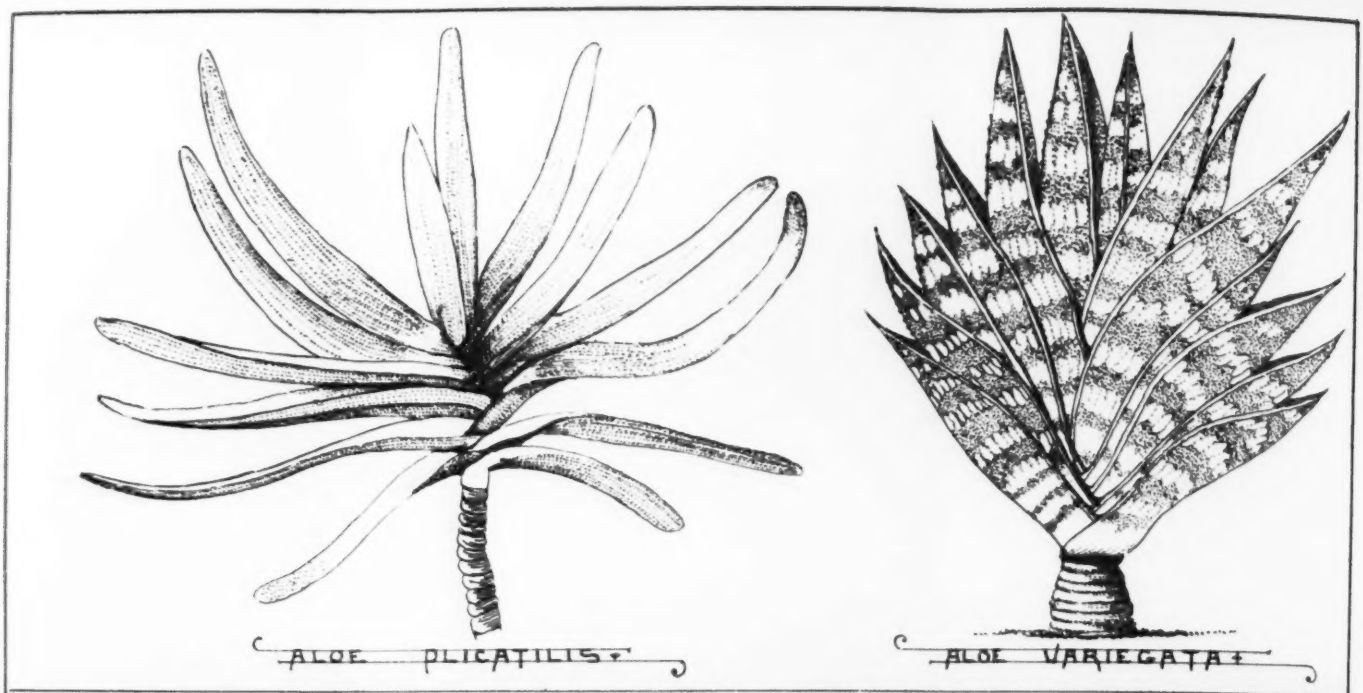
Civil Engineer.

P.S.—2·3 ft. in depth of water equals 1 lb.

Museum of Sanitary Appliances for Edinburgh.—A correspondent suggests the desirability of establishing in Edinburgh an offshoot of the Parkes Museum. That Edinburgh should have a museum of the kind is certain, and this would be a good moment, while the attention of its citizens is awake to the importance of sanitary measures, to attempt the foundation of it.



AN ARCHITECT'S TOMB IN TORONTO, CANADA.



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DECORATIVE SUGGESTIONS FROM NATURAL FORMS. — No. 2.

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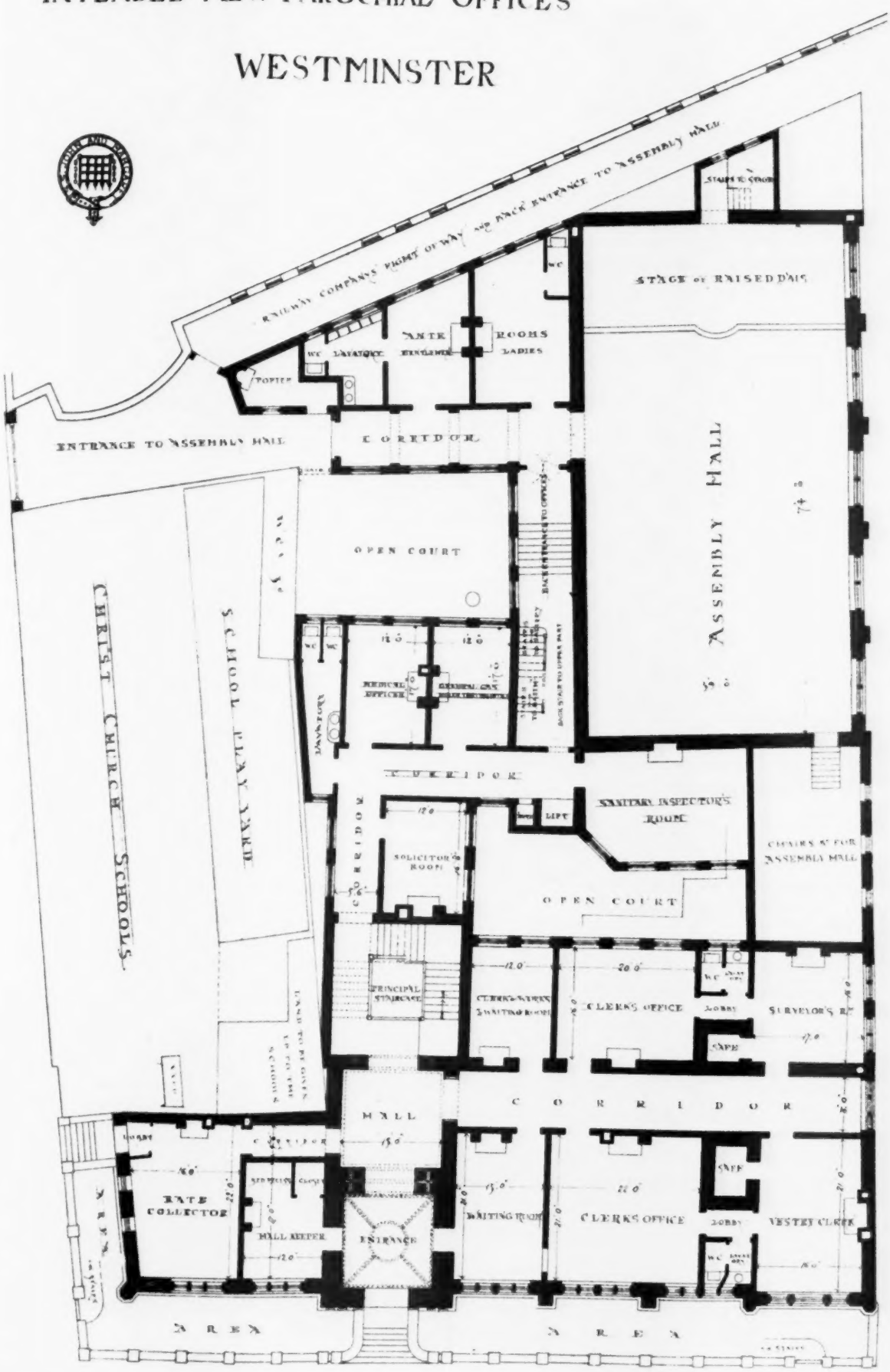

GROUND PLAN

10 5 0 10 20 30 40 50 100 FEET

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THE EQUESTRIAN STATUE OF CHARLEMAGNE, PARIS.—The Messrs. Rochet, Sculptors.

AN ARCHITECT'S TOMB IN TORONTO.

THE RAILING FROM ST. PAUL'S.

The tomb of which we give a view has been erected on a portion of High Park, Toronto, by Mr. John G. Howard, of that city, architect, in memory of his wife and in readiness for himself. The cairn is constructed with granite boulders. Mrs. Howard was a Scotch lady, which accounts for the cairn. Mr. Howard himself "is a Masonic Knight Templar,—therefore the double pedestal, terminating with the Maltese cross." The consecrated ground on which it stands is inclosed with some of the old iron railing which surrounded St. Paul's Cathedral, London, England, for 160 years. The cost of erecting the tomb, including vault and iron railing, amounted to $3,120. The granite boulders are all bedded in Portland cement against a brick shaft in the centre, which supports the marble pedestal. This weighs over 10 tons, and came from the Rutland Quarries, Vermont, U S. Engraved on a brass plate, and fixed round one of the gate-posts of the old iron railing, is the following inscription:—"Sacred to the memory of John George Howard and Jemima Frances, his wife. John George, born 27th July, 1803; Jemima Frances, born 18th August, 1802, died 1st September, 1877. Aged 75 years." On a brass plate fixed round the other iron gate-post:—

"St. Paul's Cathedral for 160 years I did inclose.
Oh! stranger, look with reverence.
Man! man! unstable man!
It was thou who caused the severance.
J. G. H.
Nov. 18th, 1875."

The vicissitudes of the railing are curious. After its removal from St. Paul's it was purchased by Mr. Robert Mountcastle, Waverley-place, St. John's-wood, London, of Mr. J. B. Hogarth, iron merchant, London, and shipped by him in good condition, on board the steamship *Delta*, for Toronto, on the 14th of October, 1874. The *Delta* went on shore about five miles below Cape Chat Light, on the 8th of November. A portion of the railing was recovered from the wreck, and sent to Montreal by the salvage men in the spring of 1875, in a very mutilated state, but was brought from Montreal by Mr. Howard, 17th of August, in that year, and arrived in Toronto on the 21st of the same month. It was repaired by Messrs. William Hamilton & Son, at the St. Lawrence Foundry, Toronto, and finally fixed on the stone curb where it now stands, on the 18th of November, 1875.

Mr. Howard has behaved munificently to Toronto. High Park, which contains 165 acres, was his property, and had cost him $50,000. Having been largely employed as an architect and civil engineer in Toronto and Canada generally, he considered it his duty to return a portion of the property he had accumulated to the Corporation of Toronto, and the land has been conveyed in trust to the citizens for a public park. One hundred and twenty acres they already occupy, and the other forty-five acres, with all the buildings thereon, they will have after his death, with the exception of the consecrated eighth of an acre, on which is erected the tomb we have illustrated.

DECORATIVE SUGGESTIONS FROM NATURAL FORMS.—No. II.

The aloe and cactus tribe of plants are for the most part rather eccentric than beautiful in outline or style, and not sufficiently decisive in design to furnish much suggestion for ornament; but there are some varieties which are exceptional in this respect. Of these, *aloe plicatilis* is remarkably effective and very regular in design. Its leaves, if they can be so called, grow in a radiating arrangement from the end of the stalk, but the lower leaf only actually and visibly springs from the stalk; the next leaf springs from within the folds of the springing of the lowest leaf, in the opposite direction; the third leaf in the same way develops from the springing of the second leaf, and so on to the top. Thus the bases of all the leaves form a considerable mass in prolongation of the line of the stalk, and regularly folded one within the other in alternate directions, hence the specific name *plicatilis* (*plica*, a fold). The leaves generally lie all in one plane, more so for the most part than in the specimen sketched here, which is a little more irregular; the growth has thus a remarkably artificial and contrived appearance, and requires in some respects less conventionalising than is often the case in translating natural objects into ornament. It is here shown adapted for a wrought-iron railing or grille, in which the folding of the leaves one within another can be carried out almost as in the natural plant, and in a manner perfectly in accordance with the character and the working of wrought iron. It may be added that the turn of the sprays in various directions, falling to one side and the other in the general design, is also almost directly borrowed from the natural plant, in which the collections of leaves grow,—some upright and some drooping in graceful curves to one side or the other, the curves being merely made symmetrical in adapting them to the present design. A more conventional treatment of the plant for wood inlay is suggested, such as might form the border of a wainscot.

The *plicatilis* is a tree aloe, with the stalks growing from a central stem, thus differing from the most typical form of aloe, which is only a mass of thick fleshy leaves all springing from one short stump. This typical form of aloe, as was remarked above, is little suitable for decorative use; but a little specimen of *aloe variegata*, which is here sketched (the plant is only 4 in. or 5 in. high), though keeping the general character of the aloe type, is exquisitely graceful and finished in its lines and construction and its varied arrangement of tints (white and green). In plan the plant is triangular, with slightly hollowed sides, and is almost as regularly constructed as a work of art. It is, however, perhaps for that very reason, difficult to treat ornamentally; an attempt is here made in the form of a marble inlay for a border.

PROPOSED POST AND TELEGRAPH OFFICES, WELLINGTON, NEW ZEALAND.

It always gives us pleasure to comply, so far as we may be able, with requests from our distant colonies that we should make known "at home" what they are doing. In our present number we therefore publish, with some other colonial matters of interest, the design by Mr. Thomas Turnbull, which has been selected in competition, for the Post Office and Telegraph Office proposed to be erected in Wellington, New Zealand, and will, we believe, be carried out. The offices will occupy the whole of the block from Grey-street to Panama-street, the frontage to Custom House-quay being 172 ft., while the Grey and Panama street frontages will be 70 ft. each. The building will be Italian in style, and will be 61 ft. in height, a clock-tower rising from the centre of the front 150 ft. in height. The centre block will be accentuated by eight detached columns standing on pedestals, and surmounted with an entablature and balustrade, the angles being also accented by rusticated quoins and pilasters. The first and second stories will have segmental-headed openings, with pilasters between, those of the third story being circular, and the whole will be surmounted with a handsome entablature, and a parapet with balustrade over it. The pediments at each angle will contain the royal arms, and will be ornamented on the Post-office portion of the building with a statue of Mercury, while Jupiter will occupy a similarly commanding altitude at the Telegraph portion. The public entrance will be in the centre of the Custom House-quay frontage, a flight of steps giving access to an open vestibule, 28 ft. by 12 ft. The Post-office portion of the building will be between this entrance and Grey-street, the remaining, or Panama-street portion, being allotted to the Telegraph department. The postal boxes will be in the vestibule, and to the left will be the public room, 40 ft. long by 19 ft. wide, in which money orders, letters, stamps, &c., may be obtained. The private boxes will be in the rear of the mail-room, the entrance being from Grey-street, and the arrangements on this floor also comprise a strong-room, lavatories, and a letter-carriers' room, the dimensions of the latter being 15 ft. by 23 ft. The upstairs portion of the Post Office will be reached by a staircase from an entrance in Grey-street, and also a stair in the tower. Facing Custom House-quay will be a clerks' room, 39 ft. long, by 19 ft. wide, and another room for the chief clerk, 15 ft. by 19 ft. The secretary will have a room, 24 ft. by 19 ft., and the Postmaster-General and Commissioner of Telegraphs another apartment, 19 ft. by 20 ft. The inspector's room will be also on this flat, and will be 19 ft. square, in addition to which there will be a dead-letter office, 37 ft. by 19 ft., a messengers' room, 23 ft. by 12 ft.; a strong-room, 8 ft. by 12 ft.; and a cloak-room, 15 ft. by 13 ft.

The Telegraph Office will have its public entrance also by the vestibule, the public room being on the right, 31 ft. long by 17 ft. wide. This will be divided by a glass screen from the clerks' office, the latter being 32 ft. long by 10 ft. wide, and lighted in the rear from a paved court or area, 36 ft. long by 19 ft. wide. Upstairs, on the first flat, the whole of the frontage to Custom House-quay, will be an instrument-room, its dimensions being 73 ft. by 28 ft., and the rear portion will contain a storekeeper's room, 50 ft. by 18 ft., and another, 27 ft. by 18 ft. The building will be of brick, cemented, and the estimated cost is 17,000*l.*

PROPOSED WESTMINSTER PAROCHIAL OFFICES.

SECOND PREMIATED DESIGN.

In our present number will be found illustrations of the design by Mr. John E. Trollope, architect, to which the second premium was awarded. As in the case of the design selected for the first premium,* we condense some portions of the architect's own description. It was proposed that the whole of the basement-walls, including the footings, should be constructed in concrete; the external walls above the basement to have an external facing of stone, a lining of brick, and a core of concrete; the principal stair to be of stone, and all the main corridors of concrete, covered with mosaic pavement; the roof to be covered with Broseley tiles.

On the ground-floor the rate-collector has his separate apartment, with entrance from Gardener's-lane, and also internal communication with general offices. The other officers of the Vestry have the accommodation required, each being provided with a separate lavatory.

As to the elevations, the designer says,—"It will be seen that I have kept all the rooms on two floors, and avoided attics. I had two reasons for this; first, I felt that to produce a satisfactory effect, the vestry-hall ought to have an open roof. This at once precluded the idea of having rooms above it; and, secondly, that it appeared to me that any new building so much higher than its surroundings would have a most disastrous effect, and look obtrusive."

The tower is covered with a wooden roof, provided with a bell stage; below, a clock is placed, and again below is the great water-tank.

The cost of carrying out the design for the offices is estimated at 15,000*l.*

At the back of the general offices, with a separate entrance, is placed the assembly-room, provided with a stage or raised dais, gallery, ante-rooms for performers, ante-rooms for visitors, a porter's lodge, and a room for refreshments and the storing of chairs. The assembly-room, it was estimated, would accommodate 500 persons, and could be used for meetings of ratepayers, theatrical representations, concerts, lectures, balls, &c., and could be made self-supporting. The cost of this building could not be included in the sum of 15,000*l.* allowed by the Vestry, and was estimated at 3,800*l.* The assembly-hall, being entirely separate from the vestry-hall and offices, might be built at any future time. The architect has purposely kept the hall as plain in design as possible, retaining flat walls for colour decoration. The ventilation, he considers, would be perfect, and the acoustic properties good.

THE EQUESTRIAN STATUE OF CHARLEMAGNE, PARIS.

Visitors to the Paris Exhibition of 1878 will perhaps remember, among the many features of that great show, the colossal equestrian statue of Charlemagne, of which in our present number we give a view. As a portion of the exhibit of the well-known bronze-caster, Thiebaut, the group attracted, notwithstanding that its position was far from calculated to show to advantage the merits of its design, no small share of attention. At the time when the statue was placed in the Champ de Mars, no site had been decided on, and only recently, after much discussion, has its destination been

* See pp. 449, 453, *ante*.

settled. The remarkable design of the two brothers Rochet,—one of whom, Louis, died, it may fairly be said, in harness,—will at length find a worthy resting-place in the square of the Parvis Notre Dame in Paris,—a spot thrice hallowed by ecclesiastical, secular, and romantic recollections, and additionally interesting as being the original nucleus of this great capital, the island in which the primitive city for many centuries was concentrated. No spot, indeed, could have been chosen which would have been more in accord with the wishes, not alone of the authors of the statue,—both no mean archæologists,—but of the designer of the simple pedestal, the late M. Viollet-le-Duc, whose name is indissolubly connected with Notre Dame.

The brothers Rochet are, as perhaps may be remembered, the authors of the remarkable colossal equestrian statue of William the Conqueror at Falaise, as also of the Don Pedro (another equestrian and colossal statue), which stands in Rio de Janeiro. For France, a peculiar interest is connected with the memory of the Great Charles, whose reign shone so brilliantly in the Dark Ages over his vast empire, and particularly over Gaul, then but recently, to speak comparatively, freed from Roman rule. It was not the intention of the brothers Rochet, in creating this statue, to claim for their country the honour of having given birth to Charlemagne, whose name stands so prominently in the pages of French history. Germany, as is well known, has long set up her claim as the fatherland of Charlemagne, but the Rochets, after patient research, have satisfactorily proved, to Frenchmen at least, that the grandson of Charles Martel was born, not at Salzburg, but on the banks of the Oise, where resided, at the moment of his birth, Pepin and his family.

In the composition of their group the sculptors have, it will be seen by the illustration, most skilfully avoided the difficulty met with so often in equestrian statues, where the principal figure is not in violent action. The days have passed, apparently, when a Colleone, or indeed a Charles I., can be successfully designed by a new Verrocchio, a Donatello, or a Le Sœur, as quietly seated in calm repose; but the brothers Rochet, earnest as they have been in their literary and archæological pursuits, cannot, we suppose, be expected to study with the minute care of a Leonardo da Vinci the pose of an equestrian statue. The difficulty of the single equestrian figure has therefore been overcome by flanking the Emperor with the two famous and almost legendary figures of Roland and Oliver, sung of by Ariosto and the troubadours of old. The paladins leading the horse of Charlemagne, his hands are free for action; the left is firmly planted on the hip, the right grasps proudly the sceptre which the wise and good monarch wielded over the vast empire he had gathered under his rule.

The group is to be erected, as we have already mentioned, in the great square before Notre Dame, which has only recently been opened up by the demolition of the old Hôtel Dieu, to which reference was made not long ago in these columns. Here the statue will, in course of time, stand; but as yet no visible preparations have been made on the spot. The group, which is of bronze, and no less than 25 ft. high, will be placed on a granite pedestal,—designed, as above stated by the late Viollet-le-Duc,—and itself 16 ft. 6 in. high.

For France, a peculiar feature connected with this colossal group consists in its having been purely the work of private initiative, undertaken entirely at the risk and cost of two worthy artists, unassisted by the usual support of a Government subsidy. It is but a fitting recompense to their united labours that they should receive the reward of having their work at length erected in Paris, where their reputation stands high in the esteem of the world of art and of letters.

The Exhibition of Gas Apparatus, Glasgow.—On the 8th inst. Professor A. Vernon Harcourt, of Oxford, delivered, in the Burnbank Drill Hall, the first of a course of special lectures under the auspices of the Philosophical Society of Glasgow, on subjects illustrated by the exhibition of apparatus for the utilisation of gas, electricity, &c. Dr. A. Fergus, the president of the society, occupied the chair. The Professor gave an interesting address on "Domestic Gas-lighting," for which he received a hearty vote of thanks.

RHIND LECTURES IN ARCHÆOLOGY.

The second of the Rhind Lectures in Archæology was delivered last week in the Freemasons' Hall, Edinburgh. Sir Walter Elliot occupied the chair, and there was a large attendance.

Mr. Joseph Anderson, the lecturer, said he meant that day to deal with "Decorative Stonework." The St. Vigeans group first occupied his attention. In the course, he said, of repeated alterations, and latterly of a very extensive re-construction of the fabric of the church, it was found that the twelfth-century builders had utilised a large number of fragments of sculptured monuments as building material. After describing in detail the features of the various remains, the lecturer said he would group the points of interest of one of these remarkable monuments. It bore the cross on the obverse side, symbols and figure-subjects pictorially treated on the reverse. The cross was long-shafted, and the full-length of the stone. It was also peculiarly formed. The long-shafted cross was often called the Latin cross in contradistinction to the cross with four arms of equal length, which was the common Eastern or Greek cross. But the lines of the Latin cross always made angles at the intersections of the arms. The cross he spoke of was not of the usual form of the Latin cross. It had semicircular hollows at the intersections of the arms with the shaft and summit. This was a peculiarity specially Celtic. The stone also bore an inscription in the Celtic language, written in the alphabet used in the Celtic manuscripts. It presented pictorial representations, which included the human figure, and a variety of animal forms, some of which were true to nature, while others were only imaginary. It presented pictorial representations of objects such as the mirror and the comb, which were true to the reality; and also of objects such as the double disc or crescent, which were found frequently recurring with a remarkable persistency of form on other monuments, although it was utterly impossible to give them names or tell their significance. Apart from the ornamental work on this monument, there are two distinct phases of art—a pictorial, which followed nature and reality, and a conventional, which followed arbitrary and unknown rules. After considering briefly what mode should be followed in the inductions from these rules, the lecturer said that from these features and these considerations to which they gave rise it was evident that, in contemplating the monument as a whole, we stood in the presence of a work of art which did not link itself on with any custom or usage existing in the locality at the present time. The Celtic language still survived in a small proportion of the place-names of the parish, but not one in a hundred of those to whom these names were familiar had any suspicion of their Celtic origin, and this inscription was now the only surviving witness of the fact that the Celtic alphabet as well as the Celtic speech was once known in the lowlands of Angus. The characteristic ornamentation of the monument was unfamiliar to modern eyes, and perplexing to modern ideas. Its symbolism was even less familiar than cuneiform inscriptions and Egyptian hieroglyphs. The stone remained, but the ideas which its art embodied have passed away with the culture which produced them. It had outlived that culture so long that the language it was intended to speak was now unintelligible. Yet that it once spoke eloquently to all eyes, who could doubt? Men did not make monuments without a meaning, unless when their poverty of invention obliged them to have recourse to obsolete forms, and to appropriate the symbols of a dead faith. In St. Vigeans they had a very remarkable group of monuments, remarkable alike as regarded their number and their character, for thirty such monuments was a very large number as compared with all the others existing. If they pictured this group of thirty such monuments clustered round the pre-Norman church on its isolated mound, if they considered the quality of the art, the interest of the one fragmentary inscription that remained, and the mystery of the symbolical representations that occur among them, they could not but regret that a group of memorials so singularly interesting, impressive, and instructive, should thus have suffered irretrievable destruction. They could judge of what had been lost by what remained of these mutilated products of a national school of sculpture, to which the special culture of the present day did not disdain to turn for instruction and for inspiration. He could only draw their attention to the fact that these memorials were neither poor in design nor feeble in execution,—that they were, on the contrary, the productions of able minds and practised hands. Mr. Anderson then went on to speak of the form and characteristics of the Aberlemno group, and their relation to that of St. Vigeans, passing on to describe the Meigle group, and the general features common to the three groups. Special attention was directed to the intense Celticism of their decoration. The transition from the purity of Celtic art to twelfth-century types was then sketched, followed by a consideration of the special features of the pure Celtic type, the area of the type (which is extremely limited), the ruder type which became associated with it, leading on to the period of incised symbol stones. The relative sequence of the two types, and their association with a third, brought the lecturer to deal with the two varieties,—earlier and later,—of free-standing crosses. Speaking of one of the specimens at Iona, Mr. Anderson said it presented no figure-subjects, but was decorated in the purest style of Celtic art with such inimitable beauty, intricacy, and harmony of design, that he was safe in saying of it that no finer specimen of art-workmanship in stone exists in Scotland. Somewhat similar in style, and not inferior in workmanship, was the beautiful cross at Kildalton in Islay. The special feature of its ornamentation was the intense Celticism of its art. No other specimen exhibited this in such a striking manner. Its two panels were filled with divergent spirals and trumpet patterns, and mingled with circles enclosing groups of spirals, and wherever they might be found, and in whatever material they might be executed, would be certainly recognised as products of Celtic art. Nothing like them could be instanced among the art products of any other people or any other time. It might appear to some that he made such remarks as these with what might be regarded as needless iteration. But he did so because he wished to set clearly in the broad light of the present culture the important fact that many of these little-regarded relics of the earlier culture of our country were worthy of attention, for this reason, if for no other, that when they were gone there would be no more like them in the world,—the species would be extinct. It did not seem as if they yet realised the fact that as a nation we were the sole possessors of a series of art products unique in their character, and possessed of such merit as works of arts that the great world of culture would not willingly see them perish.

ELECTION OF TWO DISTRICT SURVEYORS.

At the meeting of the Metropolitan Board of Works on the 8th inst., the first business was to receive the following report from the Superintending Architect on a letter from Mr. R. L. Sibley, District Surveyor for Clerkenwell, requesting the Board to determine the amount to be paid to him, as *interim* surveyor of the late district of West Islington, by the incoming surveyors of the two districts into which the greater part of the district has been divided by the Board:—

"Mr. Sibley, in offering his thanks and acknowledgments to the Board for the recent addition made to his district,* also requests that the Board will determine the amount to be paid to him for his services as *interim* surveyor of West Islington. Mr. Sibley has been acting as *interim* surveyor for a period of ten weeks, and as comparatively few building works have been commenced and completed during that period, he will obtain no adequate return for his services unless the Board order the surveyors who may be elected to pay such a sum to him as the Board may consider equitable.

The fees received in the district during the year 1879 amounted to 1,084*l.* Assuming that the portion of the late district of West Islington, to which Mr. Sibley has been appointed, will produce 84*l.* per annum, and that the remaining portion is of the value of 1,000*l.* per annum, the proportionate value of the latter for a period of ten weeks would be 192*l.* Should the Board see fit to accede to Mr. Sibley's request, I think that the surveyor to be elected for the North-west Islington District might fairly be asked to pay Mr. Sibley 10*l.*, and the surveyor for the South-west District 90*l.*, in consideration of Mr. Sibley surrendering to them all fees to which he may have become entitled for work within the respective districts."

(Signed) George Vulliamy.

After some discussion, the Board resolved to accede to Mr. Sibley's request, and to adopt the recommendations contained in the Superintending Architect's report.

The Board then proceeded to the election for the two vacant surveyorships, taking that for

* See *Builder*, p. 346, *ante*.

North-west Islington first. There were thirty-three candidates for each appointment. The usual practice was followed of first voting for all the candidates in alphabetical order, and then selecting the six candidates who obtained the highest number of votes from whom to make the ultimate selection. For convenience sake, we give side by side the names of the candidates, together with the number of votes received by them in the preliminary voting for each appointment, viz.:—

	North-West Islington.	South-West Islington.
Ashbridge, A.	19	12
Bridgman, H. H.	22	18
Brooks, C. W.	15	10
Buxton, W. J.	1	2
Carritt, E.	18	22
Conder, A.	14	14
Dale, D. R.	20	22
Edmeston, J. S.	8	11
Elkington, G., jun.	12	13
Ferguson, J. M.	9	6
Grellier, W.	3	2
Hammond, F.	29	0*
Hanbury, C.	0	0
Hewitt, E. R.	12	13
Hunter, P.	13	14
James, J. W.	13	10
Karslake, L.	8	7
Large, W. A.	29	19
Lees, W. H.	10	13
McDonell, G.	24	22
McLachlan, H.	12	13
Mundy, T. E.	7	5
Notley, F. C.	12	10
Pownall, R. E.	4	1
Quilter, J. S.	11	14
Scrymgour, W. H.	15	12
Smallpeice, W.	7	6
Stenning, A. R.	21	17
Stone, T.	3	5
Street, E.	22	18
Taylor, A. T.	4	6
Todd, F.	17	15
Waine, W.	1	2

North-West Islington.

The five candidates who received the highest number of votes for North-West Islington were therefore Messrs. Bridgman, Hammond, McDonell, Stenning, and Street. There being a tie between Messrs. Dale and Large, a vote was taken as to which gentleman should be included in the six for subsequent voting, with the result that Mr. Dale received 19 votes and Mr. Large 12. Mr. Large was therefore out of this contest. The subsequent voting was as follows:—

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Sixth Vote.
Bridgman	9	—	—	—	—
Dale	16	16	18	16	—
Hammond	28	29	29	29	23
McDonell	24	20	20	23	12
Stenning	16	17	16	—	—
Street	19	12	—	—	—

Mr. Hammond was therefore declared to be the successful candidate.

South-West Islington.

The six candidates who received the highest number of votes in the preliminary voting for the South-West Islington surveyorship were Messrs. Bridgman, Carritt, Dale, Large, McDonell, and Street. The subsequent voting was as follows:—

	Second Vote.	Third Vote.	Fourth Vote.	Fifth Vote.	Sixth Vote.
Bridgman	10	—	—	—	—
Carritt	16	11	—	—	—
Dale	20	19	23	17†	14
Large	17	14	14	17†	—
McDonell	21	21	23	21	20
Street	15	17	13	—	—

The result, therefore, was that Mr. McDonell was the successful candidate.

Both the successful candidates thanked the Board for their election, and promised to fulfil the duties of their offices subject to the usual conditions imposed by the Board. They also agreed to conform to the Board's order as to the payments to be made by Mr. Sibley, the *interim* surveyor.

ROAD FORMATION AND STREET PAVEMENTS.

Sir,—I have read "Civil Engineer's" letter on the above subject with great interest and pleasure. Taking a great interest in macadamised roads, I agree with him it is of the utmost importance that the granite should be of the hardest description, especially in this time of steam rollers.

Could not "Civil Engineer," or other of your numerous readers, give some particulars as to the crushing strength of the principal granites now in use, for I am sure this information would be of great service to many of the readers of the *Builder*.

One Interested.

* Previously elected for North-West Islington.

† There being a tie here, the Board voted as to which name should be retained: Dale 20, Large 15. Mr. Large was therefore out of it.

THE SUNDAY SOCIETY IN EDINBURGH.

A largely and influentially attended conference under the auspices of the Sunday Society was held on Monday afternoon at the Royal Hotel, in Edinburgh, convened to consider the desirability of extending the Society's organisation in Scotland, particularly as regards Edinburgh.

The Rev. John Glasse, of Old Greyfriars (Church of Scotland), presided, and, in the course of an able defence of the objects of the Society, he ridiculed the idea that the friends of the Society were endeavouring to secularise the Sunday,—a fear engendered by ignorance and prejudice. The Sunday Society simply asked these people, since they could not interest the "lapsed masses," to allow the Society to try to do so by elevating their tastes and engaging their attention in loftier pursuits than those usually indulged in.

Dr. Andrew Wilson, Edinburgh, in a well-considered speech, which was much applauded, proposed the first resolution, approving the objects of the Sunday Society. This was seconded by the Rev. Alexander Webster (Church of Scotland). He said the question of opening museums and galleries on Sunday had made great progress in Scotland. Those who took part in it were now no longer talked of as irreligious. It was simply said that the change was not expedient.

Major-General Forlong seconded this resolution, and it was supported by Mr. Mark H. Judge (London), and carried. Petitions to Parliament were settled, and after several other speakers had addressed the Conference, it was agreed to establish a branch of the Sunday Society in Edinburgh. The meeting was very enthusiastic, and was one of the best of its kind ever held north of the Tweed.

COMPETITIONS.

Liverpool Conservative Club.—The Committee of the Liverpool Conservative Club some time ago offered three premiums for the best designs for a new Conservative Club to be erected on the site in Dale-street. The competition was limited to Liverpool Conservative architects, and twenty-seven competed, sending in twenty-nine designs, comprising 300 drawings. These have been hung in two large rooms in the Stock Exchange Buildings, and inspected by Mr. Waterhouse, who has awarded the premiums as follow:—First premium (100*l.*), Messrs. F. & G. Holme; second premium (50*l.*), Mr. C. O. Ellison; third premium (25*l.*), Mr. George Bradbury. The committee of the club have endorsed these awards. A feature of the competition was that the motto system was discarded, each design bearing the name of its author. The site of the proposed building has an area of 1,100 square yards. The cost of carrying out the plans to which the first premium has been awarded is estimated by their authors to be 28,000*l.* They represent a building whose cubic contents are 710,000 *ft.* The front elevation (according to the *Liverpool Daily Post*) exhibits a rather striking façade to the main thoroughfare, with the chief entrance near Cumberland-street. The club will contain four stories, and the whole of the building is to be devoted to club purposes, with the exception of the basement, in which the offices of the Constitutional Association will be placed. The design is Classic in style. The plans of Mr. Ellison represent a building having cubic contents of 645,000 ft., the estimated cost being 26,855*l.* Mr. Bradbury's plans are estimated to cost 31,000*l.*, representing a building having cubical contents of over 776,500 ft.

The Rowland Hill Memorial.—On the 8th inst. a meeting of the Committee of the Rowland Hill Memorial Fund was held at the Mansion House, the Lord Mayor presiding. There were present Mr. Alderman Nottage, Mr. Alderman Staples, Sir Francis Lycett, Sir John Bennett, Mr. S. Hope Morley, Mr. Charles Barry, Mr. Deputy M'George, Mr. Rokeby Price, Mr. James Whitehead, and others. The fund, including interest, amounted to 17,065*l.*, most of which was invested. The sub-committee, with reference to the erection of a statue of Sir Rowland Hill in the City, and the provision of a bust of Sir Rowland in Westminster Abbey, recommended that they should be empowered to spend a sum of about 2,000*l.* on those objects. The City Commissioners of Sewers had granted a site for the statue at the south-east corner of the Royal Exchange, facing Cornhill, and the sub-committee recommended that from the twelve sculptors whom they had selected one should be chosen by competition under conditions which they detailed. The report was received. The sculptors who were stated to have consented to compete were Mr. Birch, A.R.A., Mr. Eli Johnson, Mr. J. Bell, Mr. E. R. Mullins, Mr. J. H. Thomas, Mr. Charles Bacon, Mr. Adams-Acton, Mr. Keyworth, Mr. Williamson, Mr. E. O. Ford, Mr. Bruce-Joy, and Mr. Forsyth. Mr. Bell, however, writes contradicting the statement that he had consented to compete, and enclosing a copy of the letter which he sent in reply to the invitation to do so. In that reply he wrote,—"Although not unready, under certain circumstances, to contribute to a competition for a subject of two or three figures, presenting the opportunity for variety of design, I do not take part in unpaid competitions for a portrait statue by itself, not being able to afford to give thought and time for only the chance of employment." In reply to Mr. Bell's disclaimer, the secretary of the committee writes to say that Mr. Bell's letter "was only taken as declining to enter into an 'unpaid' competition. As the committee have decided to remunerate competitors for their designs and models, it was thought fair to Mr. Bell to give him an opportunity to compete under this very different aspect of the case. Of course the committee are quite indifferent as to whether the competition is to be without or with Mr. Bell." This epistle is not only impertinent, but, unless each of the competitors is to be remunerated for the design he sends in, somewhat disingenuous. If the writer has authority for the statement that the committee are "quite indifferent" as to the sculptors who compete, it is to be hoped that the subscribers to the memorial will not tolerate such indifference, likely as it would be to eventuate in a very indifferent statue to a man who has rendered the world a great service. [Mr. Bruce-Joy also writes to say that he did not accept the invitation to compete.]

St. Matthew's Church and Vicarage, Bayswater.—In a limited competition for rebuilding St. Matthew's Church and Vicarage, Bayswater, the committee unanimously selected the design submitted under the motto "Columns avoided," the author being Mr. John Johnson, of Queen Victoria-street, City. It is proposed to proceed with the church as soon as possible, the estimated cost of which, with tower and spire, is 16,000*l.*, and the vicarage 3,000*l.* Messrs. Dove Brothers, builders, of Islington, will carry out the works under the superintendence of the architect.

MONUMENTAL.

Major Whyte Melville.—A memorial of the late Major Whyte Melville, the gifted novelist, whose untimely death a year or two ago was so widely lamented, has just been completed at St. Andrew's, N.B. It takes the form of a drinking-fountain, on which the sum of 700*l.* or 800*l.* has been expended. Occupying a well-chosen site in the long and wide thoroughfare of Market-street, it will form one of the most conspicuous objects in the town, being of sufficient height to engage attention from a distance. The stone used in the structure is (according to the *Scotsman*) principally Dumfries red sandstone, the columns and copings being of polished Dalbeattie granite. The lower basin of the fountain, which, like the two higher ones, is of red sandstone, but has a granite coping, and is approached by a step of the same material, measures 14 ft. in diameter, and rises 3 ft. 4 in. above the ground. From the centre of this basin there rises a cluster of five granite columns, surmounted by carved capitals of sandstone, which, in turn, support the second basin. On this basin, which is quatrefoil in plan, a great deal of work has been bestowed, the stone being elaborately carved in designs representing water-plants. On each face of the quatrefoil there is placed a medallion in white marble,—one showing a bust in bas-relief of the late Major Whyte Melville, by Mr. J. E. Boehm, A.R.A., the second and third bearing respectively the family arms and the shield of the Coldstream Guards, in which the deceased was an officer, and the fourth being occupied with an inscription. The third stage of the fountain is a reproduction of the second on a smaller scale, the arrangement of a basin supported by granite columns being repeated,

with the variation that the columns in this case are octagonal. Above this there rises a moulded finial of red sandstone, carrying the fountain to the height of about 14 ft. from the ground. Water will be discharged from gurgoyles, four of which are disposed round the second and four round the third basin, as well as from five jets, four of which are on the second stage, while the fifth is concealed within the finial. The design for this monument, and those for the tomb-stone at Tetbury and for a mosaic tablet in the Guards' Chapel at Wellington Barracks, were prepared by Mr. Edis, F.S.A., London; the carving was executed by Mr. Earp, of London; and the work of erecting the St. Andrew's fountain was entrusted to Mr. G. Wallis, London.

Mr. Charles Larkin.—The memorial erected by public subscription to the memory of Mr. Charles Larkin (an orator of more than local renown) in Elswick Cemetery, Newcastle-on-Tyne, was unveiled on the 30th ult. by Mr. Joseph Cowen, M.P. The memorial is Classic in style. It consists of a broad base arranged in step form, upon which is placed a square pedestal, panelled on all four sides, and finished with curved ogee pediments and a dentil course. Above this is the bust of the late orator, surmounted by a pedimented canopy carried on four groups of clustered columns with Ionic caps. The canopy is domed internally, and externally finished with a richly-carved and moulded monumental urn. The whole has been executed in Denwick stone, by Mr. G. Burn. Messrs. Oliver & Leeson were the architects.

Archdeacon Thorp.—A memorial of the late Archdeacon Thorp has just been placed in Kemerton Church. When the chancel was rebuilt by Cambridge friends of the archdeacon, about thirty-five years ago, an arched recess was constructed in the north wall of the sacrarium, destined to receive a monument to his memory as the re-builder of the church. The back of this recess has been filled with diaper work, copied from an example in Canterbury Cathedral. On the floor of the recess, and raised a few inches above it, is the recumbent figure of the late archdeacon, vested in surplice, stole, and hood, and bearing between his hands a chalice resting on his breast. On either side of the head are shields bearing the family arms, and the same impaled with the arms of the Archdeaconry of Bristol. In a slab of Red Emperor marble, of a soft dove colour, the figure is incised in bold lines. These are filled in with black mastic, the larger spaces, such as the stole and shoes, being of black marble. Round the figure is a diaper in yellow Sienna and black marble, while the head reposes on a diapered cushion. The whole surface, which is perfectly flat, bears a high polish. The monument has been erected under the direction of Mr. R. Herbert Carpenter, architect, son of the architect who restored the church. Messrs. Clayton & Bell designed the incised slab, and the whole work has been carried out by Mr. George Hill, of Chelsea.

Mr. James Cassie, R.S.A.—The monument to the late Mr. James Cassie, R.S.A., erected by private subscription over his grave in the Dean Cemetery, Edinburgh, was placed in position on the 5th inst. Designed by Mr. George Reid, R.S.A., and executed in red granite by Mr. Alexander Macdonald (of Macdonald, Field, & Co., Aberdeen), the memorial resembles in form one of the picturesque crosses so frequently met with in the West Highlands, and rises to a height of 11 ft. from the ground. The cross, however, in itself only measures 8 ft., as it rests upon a base about 3 ft. high. The span of the arms of the cross measures 3 ft. 9 in., and the diameter of the wheel connecting these with the upright is 2 ft. 3 in. A bold boss marks the centre of the intersection. A small panel just above the base is reserved for the inscription recording the name, together with the dates of birth and death, of the deceased painter.

Lieut. Hearsey.—On the 2nd inst., the memorial erected by his old schoolfellows at Ockbrook School to the late Lieut. C. J. R. Hearsey, of the 9th Lancers, who fell in the charge against the Afghans in the Chardeh Valley, on December 11th, 1879, was unveiled. It is situated in the entrance to the school-house, and consists of a mural tablet of Caen stone, with statuary marble slab, and Sienna marble columns, the Gothic moulding being ornamented with ivy leaves and berries. The memorial was executed by Messrs. H. & T. Green, masons, Nottingham, from the design of Mr. John S. Henson, architect, Nottingham.

THE DUKE OF CONNAUGHT'S CONSERVATORY AT BAGSHOT.

THE DUKE OF CONNAUGHT'S CONSERVATORY AT BAGSHOT.

The conservatory of his Royal Highness the Duke of Connaught forms an agreeable contrast to the usual run of conservatories, in so far it is not the conventional square usually considered indispensable in conservatory buildings. It is built on to an angle of the wall, and thereby enables an entrance to be obtained from the boudoir at one end facing the garden entrance. At the far end, on entering from the boudoir, a pleasing surprise is obtained as the visitor advances, the angle of the house doubling the width, and producing an effect scarcely expected from the narrow approach as viewed from the boudoir. In the centre of this wall is the dining-room; to the right and left of this, taking advantage of the angle in the wall at the left side, a piece of rockwork has been built with waterfalls, streams, and fish-ponds,—at all times agreeable features in conservatory decoration. The view from the dining-room is charming, disclosing one of the most extensive scenes across the park. To preserve this the decoration has of necessity been kept low; a fountain in the centre is the chief object of attraction seen from the dining-room, and it is only on entering from this door that the main features of the decoration are disclosed. Considering the short space of time allowed, the gardener (Mr. Barden) is to be congratulated on the effective appearance of his plants. The dwarf brickwork is charmingly covered with growing ferns, lycopods, mosses, &c., by a very simple and effective arrangement in tufa, the material of which the whole of the rockwork is constructed, and which enables the walls to become a mass of living foliage, forming a lively and permanent background, and giving effect to the show-plants from time to time arranged in the borders in front. The rockwork and internal decoration have been carried out by Messrs. Dick Radclyffe & Co., of High Holborn, who make such work a special feature, seeking to imitate nature in the display of floral treasures. The illustration is taken from the angle of the wall entering from the boudoir-door.

The conservatory illustrated is designed to accord with the dwelling-house (of which we have given a view).

The materials used in the construction were oak and yellow deal, and especial attention was paid to making provisions for the internal condensation, an item of recognised importance. This was effected by providing water-grooves to each sash-bar, connected with the main gutter, with successful results. In the coldest nights hitherto there have been no signs of drip.

The arrangements for ventilation consist of French casements to the sills, and lifting sashes in the roof, arranged to open simultaneously by an arrangement worked from below.

The floor is laid with Minton's tiles of special design, with ornamental fountain in the centre.

The house being much exposed to the sun's rays, it has been found necessary to protect every part by means of spring-roller outside blinds, arranged to be raised and lowered from the inside. The warming is effected by means of hot-water pipes connected with the boiler serving the dwelling-house. These pipes are placed under the floor and covered with gratings, with valves for regulating the heat.

Hot and cold water is laid on to the conservatory. The decorations are of a quiet description, so as to show the plants to the best advantage, in accordance with instructions from the duke.

The contractors for this work were Messrs. Rosser & Russell, of Charing-cross, who have also fitted up the hot and cold water supply, cooking apparatus, &c., throughout the dwelling-house.

The water supplied to the house is brought from a reservoir three miles distant, and is pumped into three large tanks provided in the tower. The motive-power is obtained from a small stream running through the grounds. The overflow from these tanks is utilised to work a water-engine placed in the basement to pump up the rain-water from an underground reservoir to a fourth tank in the tower. This is automatic in action and requires no supervision.

The architect of the mansion was Mr. Ferrey, under whose superintendence the works have been carried out.

TRURO.

Service was held for the last time in St. Mary's Church, Truro, on Sunday, and the next day the building was handed over to Mr. Jas. Bubb, the clerk of works, for demolition. All will be pulled down save the south chancel aisle, and the eastern end of the southern arcade, which, from the interesting and ornate character of its architecture, is to be incorporated bodily into Mr. Pearson's design for the new cathedral. The spire and part of the tower had already been taken down. They were of grey granite, built some 120 years ago. The mortar in which the stones were bedded was of the poorest quality, being simply earth; and the granite itself was much disintegrated by atmospheric influences. The foundation of the tower, instead of being planted upon the solid rock, was placed a few feet underground, upon a mixture of clay and stones, which appeared at

one time to have been the old bed of the neighbouring river. There are many interesting old monuments in the church; these, together with the bells, the bulb-shaped inlaid pulpit, of Dutch-like type, and all else of historical or architectural value, are to be carefully preserved on the spot, until required again. The church was reseated with open oak benches a few years ago, and these are to be at once removed into the temporary wooden church that has been erected on the north-east end of where the cathedral is to stand. This place, designed by Mr. Henderson, C.E., has been built at a cost of 430*l.* by Mr. Trethowan, and will be used until the choir is built.

TESTIMONIAL TO PROFESSOR DONALDSON.

At a quarterly court of the Scottish Corporation, held in their new hall, Crane-court, Fleet-street, on the 6th inst., Mr. Webster proposed that the best thanks of the Corporation were due, and were thereby tendered, to Professor Donaldson for the excellent manner in which as architect he supervised the erection of the new hall, and the splendid accommodation he had provided for the discharge of the functions of the institution. Mr. Gooden seconded, and suggested that the vote should be inscribed on vellum; and it was eventually left to the secretary to present the testimonial in a suitable manner. In acknowledgment of the resolution, Professor Donaldson remarked that it was above half a century since he had become a member of the court, and his father had been connected with it before him. The interests of the Corporation had always been very near his heart, and he was proud of having been allowed to undertake the erection of the new hall.

GLASGOW ARCHITECTURAL ASSOCIATION.

At the usual monthly meeting of the above association, held on the 5th inst., the secretary, Mr. Russell, read a letter from Mr. Honeyman, honorary president, announcing that he had succeeded in getting the names of six gentlemen for the series of lectures on practical subjects to be commenced this winter. The following is a list of the subjects, with dates of lectures and names of lecturers:—

Nov. 16th, 1880.—Mr. Jas. Thomson,—"Foundations."
Dec. 21st.—Mr. John Honeyman,—"The Building of Walls."
Jan. 18th, 1881.—Mr. Jas. Salmon,—"Drainage and Ventilation."
Feb. 15th.—Mr. John Baird,—"Roofs."
March 15th.—Mr. John Burnet,—"Floors and Partitions."
April 19th.—Mr. David Thomson,—"Interior Arrangements."

All the lecturers are Fellows of the Royal Institute of British Architects.

GREAT DESTRUCTION OF BRICKS.

Correspondents in a position to know, write:—The unparalleled floods of the last ten days have destroyed one-eighth of the season's make of bricks, and at a time when it is utterly impossible to make up for the loss. The total make would probably have been about 900,000,000 if the weather had continued favourable. After a careful comparison with the makers generally, it is computed that the loss is greater than the excess of manufacture over that of last year. Unless the low state of the market should alter, many of the smaller manufacturers will have to cease making after such a disaster.

In the districts of Rochester, Rainham, and Sittingbourne, some of the low-lying fields have been absolutely under water, and the drainage so choked as to be utterly unable to carry off the flood-water. In consequence of this, many millions of bricks in the hacks have been washed down, and a large portion washed away irretrievably. The deluge came so unexpectedly that in most instances the makers were totally unprepared for it. In some cases we hear that the actual loss of bricks has been quite one-third of the quantity in hacks.

The Proposed Opera-House on the Embankment.—It is stated that the project for the erection of the new Opera-house upon the Victoria Embankment has been finally abandoned.

A BLACK SPOT IN DARLINGTON.

Within the last ten years the Corporation has erected a large Fever Hospital, purchased land and formed a sewage-farm, and bought a site for new corporation offices. During the last five years, from private subscriptions and bequests, have been erected an educational training college for women, and a new grammar-school. 10,000*l.* have just been bequeathed by the late Mr. Edward Pease for a free library, and at this moment, after only a few days' notice, and in spite of the bad times, local subscriptions are pouring in for the purpose of purchasing a second-hand Baptist chapel to form a new parish church. While all this has been done, indeed for ten years before it, there has existed, and still exists, a cottage hospital, which is little better than a plague-spot,—badly designed, badly planned, and badly ventilated, and standing cheek-by-jowl with a tallow-factory! One medical officer after another has been disheartened in his labours in such a hole, and has not hesitated to speak his mind to the powers that be. The poor ironworkers and others continue to subscribe to it, the "kind ladies and gentlemen," some of them enjoying the best social positions in the town and neighbourhood, attend the committee meetings, and visit the patients; but by them not a hand is lifted, or a voice raised, to alter this miserable state of things in this "good old Quaker town of Darlington." A. B.

CASES UNDER METROPOLITAN BUILDING ACT.

PENALTY FOR NOT GIVING NOTICE.

At the Marylebone Police Court, John Allen, 24, Kilburn Park-road, was summoned by Mr. Alexander Peebles, district surveyor, for neglecting to give notice of certain building works, and executing them before giving such notice.

Mr. Peebles said that on the 30th of September in Abbey-road Chapel, St. John's Wood, he found the defendant, a builder, carrying out some alterations. An apse or alcove was being formed, and the wall of the gallery had been considerably reduced in thickness. No notice of the work had been given.

Mr. Sampson, for the defendant, said a new organ was being put in, and they were going to add externally the strength they had taken away internally. The defendant had been away, and left it to his people to give the proper notices.

Mr. De Rutzen said it was absolutely necessary that these preliminaries should be complied with. The defendant would be fined 3*l.* and 12*s.* 6*d.* costs.

WESTMINSTER VESTRY-HALL COMPETITION.

Sir,—In your exceedingly just article on this subject, with almost every word of which I agree, you say, "In all games it is considered very bad form to question the decision of the umpire." In such cases, however, the umpire has been known beforehand and accepted by the players, but not so in this.

You note that "the instructions have no reservation with regard to the public hall"; and you ask, "Has there been any subsequent understanding on this point? and, if so, did all the competitors know of it?" To this, as regards the competitors, I answer, No!

You continue, "If not, it appears to us that 'Unitas' [myself] may have a technical ground of complaint."

Such being the case, I have raised the same question as you have, but a majority of the Vestry have voted that my letter upon it *be not read*.

Now, I am painfully aware that the question, as to which you say some explanation is desirable, is an unfortunate one to be raised at this time, when it is being urged that all competitions should be settled by professional referees.

Mr. Barry, however (not I), is responsible for this misfortune. If professional men are to be judges they cannot be irresponsible ones. To whom, then, are they to be responsible? At least to the profession, in cases such as this. I look, therefore, to my professional brethren and to the professional press for support in my effort to prosecute this inquiry. John P. Seddon.

SIGNBOARDS.

Sir,—There has been going the round of the papers recently the history of hotel and public-house signboards. Will you allow me to point out one of a peculiar nature? In Soham, Lincolnshire, there is, or was, an inn called the Steam Fire Engine, with a lively oil-painting of that valuable invention. The house was kept by one George Hills, for many years head carman in the firm of Messrs. Merryweather & Sons. The painting was executed by the heraldic painter of the firm, and was presented by his fellow *employés* on his entering into a new sphere of business. M.

VARNISHING OLD FLOORS.

Sir,—I shall be glad to hear from any of your many readers a useful way to varnish or wax floors of a large public hospital. The floors have for fifty years been scrubbed, and this seems to make the varnishing more difficult. G. H. S.

Institute of Art.—The Winter Exhibition of this Society, 9, Conduit-street, W., will open on Monday, Nov. 1.

Miscellanea.

Colonel Beaumont's Hot-air Engine, on which we commented at length some time ago (*Builder*, p. 36, *ante*), was, on the 6th inst., tried on a more extended scale, with such success as to afford hope that before long humanity and economy may be promoted by the abolition of tramway horses, and that the sufferings of travellers by the underground railways may be mitigated by the substitution of atmospherical power for sulphurous locomotives propelled by steam. The engine, which has been designed by Major Beaumont, Royal Engineers, has been for some time running on the short lines of the Royal Arsenal, Woolwich, and although weighing but 10 tons, it has proved capable of hauling a burden of 16 tons up a fair incline. On the 6th inst. arrangements were made to try its powers in a more extended run, such as engines of the kind would have to encounter on London tramways and rails. The air reservoir, which contains only 100 cubic feet of air, was charged at the torpedo pumping-house in the Royal Arsenal, Woolwich, up to a pressure of 1,000 lb. to the square inch, and with this store of energy it was proposed to run to and from Dartford, about 16 miles. Major Beaumont explained the methods which he had adopted in his invention, the chief feature of which was the introduction of an almost imperceptible supply of steam, by which the air, as it is admitted to the cylinder from the reservoir, is largely heated, and, as a matter of course, greatly increased in force. The engine is driven by six cylinders and a double set of machinery at one end, and, having no smoke-stack, resembles in appearance a locomotive tender rather than a locomotive. It runs on four wheels, and in size is less than an ordinary omnibus. It left the Royal Arsenal Station at 12·22 p.m. with a full charge of 1,000 lb. to the inch, passed Abbey Wood Station at 12·27 p.m. with 940 lb. on the gauge; Belvedere, at 12·33, with 860 lb.; and Erith, at 12·36, with 760 lb., arriving at Dartford at 12·50 with a remaining energy of 540 lb. on the square inch. Shunting at the station reduced this pressure somewhat, and at 1·35 the return journey commenced with a store of 510 lb. Although the minimum for effective working is considered to be a pressure of 200 lb., Plumstead Station was reached again at 2·10, but the engine was nearly pumped out, having a pressure of barely 80 lb. remaining. It was stated that another engine is under construction, much more powerful, capable, in fact, of travelling double the distance with a single charge. The operation of pumping the compressed air occupies about fifteen minutes, and it is calculated that an air-engine on this principle, as large as the usual steam locomotive of 50 tons weight, would be considerably more powerful than any locomotive yet made.

River Pollution.—At the Berkshire Petty Sessions, on the 25th ult., the Corporation of Windsor, as the Urban Sanitary Authority, were charged by the Thames Conservancy with polluting the river by causing offensive matter to flow into the stream near the sewage works of Old Windsor, on June 14th. The magistrates fined the Corporation 5*l.*, with 5*l.* 5*s.* towards the costs.——At the Blackburn County Court, on the 11th inst., Mr. W. A. Hulton, the judge, gave his decision in a case brought before him under the Rivers Pollution Act, 1876. The plaintiffs were the Mayor, &c., of Over Darwen, and the defendants were Messrs. Shorrock, iron-founders. It was admitted that the defendants had caused certain rubbish and cinders to be put into the river, so as to interfere with its due flow, but these practices, it was urged, had been openly and as a right carried on for more than twenty years. The Judge, however, decided that the defendants had committed an offence against the Act, and issued an order that they should abstain from further commission of the offence.——The Severn Fisheries Conservators threaten to take proceedings against the Corporation of Worcester, and other public bodies, as well as private persons, on account of the discharge of sewage matter into the Severn.

Burns's Cottage.—"The Auld Clay Biggin" in which Robert Burns was born, hitherto occupied as a public-house, is about to be transferred to the trustees of the Ayr Burns Monument and converted into a sort of Burns Museum. There is a considerable area of ground attached, and this is to be attractively laid out. The price of the whole was 4,000*l.*

The Fall of a Church Floor in Manchester.—Another death (that of a man named James Kilty, aged 67) has resulted from this catastrophe, mentioned in our last. A verdict of "Accidental Death" was returned by the coroner's jury on Monday last. At the inquest held on the body of the first victim, the Rev. Bartholomew Flynn deposed that two weeks before the accident occurred he had noticed that one of the iron columns supporting the floor had moved. The schoolmaster called his attention to it. The pillar was about an inch out of the perpendicular. Mr. Walsh, the schoolmaster, tried, he believed, to put it right by placing a wedge in. Witness saw the pillar again on Tuesday before the accident. It had "gone" a good deal more. He put his hand on it and found that it was loose. He called the schoolmaster's attention to it and went out. In a few minutes after he found that the pillar had fallen. He saw that the pillar had been resting on a log. The log was not sound. Did not think that the falling of the pillar materially weakened the floor. Mr. William Nicholson, architect and surveyor, testified that about twelve months ago, at the instance of Father O'Callagan, he made an inspection of this building. Father O'Callaghan seemed to have no fear of the building, but he was going to have a mission. Witness, as the result of his inspection, told Father O'Callaghan that the floor was quite capable, provided the material was sound, to bear any weight he could put on it in the way of people,—and without the columns. Witness did not think there was any dry-rot about at that time. Was not at that time told of any cracking or giving way. He had seen the building since the accident, and he came to the conclusion that the accident was the result of dry-rot. Was with Mr. Allison, the city surveyor, there on Tuesday, and he believed that that was his opinion. The iron pillar was an element of destruction to the beam. The fungus from the foundation would go up to the beam.

St. Alban's Abbey.—Mr. Henry J. Toulmin, the hon. sec. to the St. Alban's Abbey Restoration, writes:—I hear from good authority that Sir Edmund Beckett has now given orders under a faculty lately granted to him to destroy Abbot Wheathampstead's west window (of the date of Henry VI.), and to replace it with a window of his own composition, which may be exceedingly effective to those who admire the high art of the nineteenth century, but extremely distasteful to those who respect bygone times and the historical associations of this ancient abbey. If the Society for the Protection of Ancient Monuments, aided by a small public subscription, would now proceed against and obtain an injunction, they would prevent this iniquitous proceeding, as Sir Edmund's faculty was to repair the west front, and not to destroy any portion of it. Sir Edmund is carrying out his own wilful way against the remonstrance of his bishop and the wish of the arch-deacon, rector, churchwardens, and sidesmen of the abbey church; and a petition, signed by the Lord-Lieutenant and many of the leading inhabitants of the city of St. Alban's and its neighbourhood, has lately been sent to the bishop of the diocese, requesting him to interfere. Even a lavish expenditure of money from ample resources in this pseudo-restoration will hardly recompense the men of Hertfordshire for the injury done to their great county church. A sum of 400*l.* to 500*l.* would be, I believe, sufficient to repair the window to make it last for a great many years to come. I may say Mr. John Scott, whom Sir Edmund promised to consult (but on such terms as no leading architect could submit to), deprecates and deplores this iconoclasm as much as we do."

Cemetery Chapels and the Burials Act. On the 30th ult. the Hove Town Commissioners, Brighton, held a special meeting to discuss a question which has arisen under the new Burials Act. In November last a resolution was passed for the laying-out of a new cemetery, with two chapels. As the Burials Act now permits Nonconformists to officiate in consecrated chapels, and Church of England clergymen in unconsecrated chapels, it is held that two chapels have become unnecessary. Mr. W. Olding proposed that the resolution of November should be rescinded, and that only one chapel should be erected in the new cemetery, such chapel to be consecrated. On a division 17 voted for the motion and 14 against, but as it requires a clear majority of the entire Board,—namely, 22 votes,—to rescind a resolution, the motion fell to the ground.

The Turnery Exhibition.—The tenth annual exhibition of specimens of hand-turning, under the auspices of the Turners' Company, was opened on Tuesday last at the Mansion House. The collection was a very good one. On Thursday morning the Lord Mayor distributed the prizes. The following were the judges:—In Wood—Mr. J. J. Holtzapffel; Mr. C. H. Gregory, Past Pres. Inst. C.E.; Mr. H. Law, and Mr. E. R. Robson. In Ivory—Mr. A. P. Bower, Mr. J. Jaques, Mr. T. B. Winser, Mr. Morgan Yeatman. In Precious Stones—Mr. Herbert Grueber, British Museum; Mr. J. N. Hunt, Mr. J. Jones, Mr. L. Keller, and Professor Tennant. The judges in their report say that the majority of the exhibits displayed much excellence of workmanship, in many cases novelty of design, and in several considerable appreciation of form and design. The first prize for work in wood,—a silver medal and the freedom of the Company,—was awarded to Mr. F. Nickolay, of Rupert-street, Haymarket, for a pair of vases in wood; and the second,—a bronze medal and four volumes of Holtzapffel on Turning,"—to Mr. John S. Coulson, of Thirsk, for two vases and a card-dish, also in wood. In each class a medal was to have been given provided the specimens entered were considered worthy, and under this regulation the judges have withheld the first prize for ivory turning, awarding the second, which is the same as for wood-turning, to Mr. John Hegley, of Ivy-lane, Hoxton. The silver medal and freedom of the Company, for skill in manipulating precious stones, was taken by Mr. Louis Islar, of Oval-road, Regent's Park; and the bronze medal and 5*l.* by Messrs. Reuter & Warner, of Wardour-street.

The Vyrnwy Water Scheme, Liverpool. At the meeting of the Liverpool City Council on the 6th inst., the report of the Water Committee contained the following recommendations:—That the joint tender of Messrs. Laidlaw & Sons and Messrs. Robert Maclaren & Co., to supply 500 tons of 12-in. and 500 tons of 7-in. iron pipes for the sum of 4*l.* 11s. per ton, be accepted. Also that the council accept the tender of Messrs. Cochrane, Woodside Ironworks, Dudley, for 8,000 tons or thereabouts of iron pipes for the first section of the works between the Vyrnwy Reservoir and Parc Uchaf. Mr. Wilson moved the adoption of the recommendations. Alderman Bennett objected to the contract for the 8,000 tons of iron pipes being passed that day. Iron was coming down in price, and if they waited a little longer it might come down much lower. Mr. Picton thought the council ought to be furnished with some distinct information as to the exact relation of Mr. Hawksley to the scheme. Mr. Wilson said that as soon as the draft agreement with Mr. Hawksley was made up it would be submitted to the council, and all the necessary information given. The Mayor explained that if they employed Mr. Hawksley to carry out these works his charge would be 2½ per cent. commission on the cost of them. If he was not to be the engineer, then they would have to pay Mr. Hawksley some fair amount of money for the work he had already done. The motion was carried.

The New Cattle Market at Kettering was opened on the 1st inst. It has an area of about an acre and a half. The cattle-pens, which are of wrought and cast iron, and paved in granite, afford accommodation for about 800 beasts, and the sheep-pens, which are of similar construction, will hold about 1,400 sheep. In the south-eastern corner there is a public weighing-machine by Kitchener, of Warmington. The whole of the works were designed by Mr. R. W. Johnson, architect, Melton Mowbray, and Mr. George V. Henson had the contract for the general works. The contract for the iron-work was commenced by Mr. F. B. Wallis, and finished by Messrs. Keay, of Birmingham. Mr. Coleman was clerk of the works. The total cost of the market has been 8,000*l.*

Sanitary Legislation.—Mr. William White, F.S.A., in a letter to the *Times*, says,—The reform most urgently required at the present moment is the extension of the Act which is designed to allow tenants and sanitary authorities, even in the absence of agreement, to compel landlords to amend defects in the drainage of rented houses. The Act is almost inoperative on account of the difficulties, or supposed difficulties, of exercising the coercive power without expensive litigation; but apart from this it contains no adequate provisions for the correction of defective soil-pipes and water-service.

Payment of Architects, Birmingham School Board.—At the meeting of the Birmingham School Board, on the 7th inst., the Rev. H. W. Crosskey read the report of the Sites, Buildings, and Repairs Committee. They reported that the resolution passed at the adjourned meeting of the Board on the 8th of July respecting the salary to be paid to the architects, was referred to Messrs. Martin & Chamberlain, and the decision of the Board had been accepted. For some time the work of the building surveyor, which includes the preparation of the quantities for the contractor, and the final measuring up of additional works or variations from the original contract, and the preparation of accounts, was performed by a firm of building surveyors; but considerable delay and difficulty being found to result therefrom, it has for some years past been undertaken by the Board's architects. It was, however, altogether apart from the architects' ordinary duties, and the committee considered it advisable that the work should still remain in the architects' hands, and they recommended that they should be allowed the usual professional charges for taking out and furnishing quantities, viz., 1½ per cent. and 2½ per cent. for the final measuring up of additional works and preparing the accounts. The report was approved.

Appointments.—Mr. Alfred Horne has been appointed town surveyor by the Worthing Local Board.——At the meeting of the Metropolitan Board of Works, on the 8th inst., the Works and General Purposes Committee reported as to the arrangements for filling up the vacancy caused in the engineer's department by the death of Mr. James McCleary, and recommending that Mr. H. T. Wakefield, who has for some time past been temporarily engaged in the department at a salary of 3*l.* 3s. per week, be appointed during the pleasure of the Board to fill the vacancy, and that he be placed in the third class of officers, at a commencing salary of 130*l.* per annum. This was agreed to.——The Liverpool City Council, on the recommendation of the Finance Committee, on the 6th inst., resolved that Mr. Frederick Holford be appointed a junior architectural draughtsman in the surveyor's department, at a salary of 90*l.* per annum.

The late Mr. Ashby.—The will and codicil of Mr. Richard Ashby, formerly one of the members of the Court of Common Council, late of Manor-road, Stamford-hill, who died on the 3rd ult., was proved on the 22nd ult. by Miss Ann Breakspear Ashby, the daughter, and sole executrix, the personal estate being sworn under 30,000*l.* According to the *City Press*, the testator gives a sum of upwards of 10,000*l.* due to him from his late partnership business (as builders, in Bishopsgate-street) and a policy of insurance on his life in the National Provident Institution, as to one-half thereof to his son, Richard Vaughan Ashby, and as to the other half upon trust for the widow and children of his deceased son, George Scarlett Ashby. All his real estate and the residue of the personalty he leaves to his said daughter.

Bad Building at Brixton.—At the meeting of the Lambeth Vestry, on the 7th inst., the Sewers and Sanitary Committee reported that they had visited some buildings in course of erection on the Elm Park Estate, Brixton Hill, and they requested that the Vestry would call the attention of the Metropolitan Board of Works to the quality of the bricks used in the inside walls of the buildings upon the estate, contrary to the Act of 1878. They further requested that the Board might make the necessary inquiry into the matter. Mr. Fowler said the material used was extremely bad, and it appeared that the builders had not been interfered with in consequence of the district surveyor (a bed-ridden old gentleman) being unable to attend to his duties. The recommendation was agreed to.

Lectures on Sanitary Matters.—On Monday evening last Dr. A. Maxwell delivered the second of a series of "Medical Talks" at the Young Men's Christian Association, Aldersgate-street, the subject being "Dangers to Health; or, Unhealthy Houses." A number of pipes and other utensils were lent by Messrs. Doulton & Co., of Lambeth, and Messrs. J. Tylor & Sons, of Warwick-lane, for the purpose of illustrating the lecture.

Burning of Arbroath Guildhall.—Between two and three o'clock on Sunday morning a fire broke out in the Guildhall of Arbroath. The building was completely destroyed, with documents of local and antiquarian value. The cause of the fire is unknown.

Building Societies and the Parkes Museum.—At a meeting of the directors of the Nineteenth-Century Building Society, Mr. George Palmer, M.P., chairman, held on the 6th of October, the following resolution was passed unanimously, on the motion of Miss Richardson, and seconded by Mr. Henry Rutt:—"That as, in the opinion of this meeting, a course of Lectures at the Parkes Museum of Hygiene, on House Sanitation, would be most valuable to the members of building societies (who to a very large extent own the houses they live in), the secretary of this society be requested to ask the Committee of the Museum whether such a course of lectures could not be given gratuitously during the ensuing winter."

A Roman Amphitheatre at Buda.—The Pesth newspapers describe the finding of a Roman amphitheatre at Altofen during excavations carried on there by Karl Torma. The first traces were met with on the 20th of September. That the remains are really those of an amphitheatre was fully established by the 26th. It is a striking fact that the axes of the ellipse, in which form the building was constructed, were directed with mathematical accuracy to the four points of the compass, the large axis from east to west, the small from north to south. It was also interesting to find that the size of the amphitheatre considerably exceeds that of the famous amphhitheatre of Pompeii.

Llanrwst, North Wales.—New premises for the North and South Wales Bank have lately been erected by Mr. Samuel Parry, builder, Llanrwst, at the north-west corner of the Market-place. Above the Bank are arranged suites of offices, and a large public hall, devoted to the use of the county court, magistrates' meetings, and also for public entertainments. The style of the building is English Domestic Gothic; the materials used were local stone for the walling stones, and Runcorn stone for the dressings. Half-timber framing has been employed in the upper stories. The architect is Mr. Edmund Kirby, of Liverpool.

Sewer and Closet Ventilation.—The little Cornish town of Padstow furnishes evidence of the value of the ventilation of sewers. Acting on the recommendation of the Local Government inspector, the Local Board have, during the last eighteen months, ventilated the sewers so as to permit sewage gas to escape into the atmosphere as soon as it is generated, and before it becomes dangerous to the public health. As a result, it is reported that the town has, during the last twelve months, enjoyed complete immunity from zymotic diseases.

Topography.—The Committee of the Topographical Society of London, which has been formed for the purpose of collecting and publishing maps, views, and other materials for the history of London, have made arrangements for the holding of the inaugural meeting of the Society on Thursday, the 28th inst., at four o'clock. The Lord Mayor has granted the use of the Long Parlour at the Mansion House, and will preside on the occasion. Cards for the meeting may be obtained from Mr. Henry B. Wheatley, F.S.A., 18, John-street, Adelphi.

Sewer Fatality in Birkenhead.—About nine o'clock on Wednesday morning, a shocking sewer fatality occurred at Birkenhead. Five men in the employ of the Corporation were overcome by the fumes of sewer-gas while opening a sewer in Cleveland-street. One (named Michael Dennaney) was killed, and great difficulty was experienced in restoring the others.

The New City of London School.—The foundation-stone of the new buildings for this school were laid on Thursday last, the 14th inst., by Mr. J. E. Walford, the chairman of the school committee. Messrs. Davis & Emanuel are the architects of the buildings, of which we published a view and plans in our last volume. pp. 602-5.

Builders' Benevolent Institution.—The thirty-third annual dinner in aid of the funds of this Institution is fixed for Thursday, the 11th prox., when we trust that a large number of the friends of the Institution (which has recently increased the amounts of the pensions granted to annuitants) will rally round the president, Mr. Thomas F. Rider.

The Exhibition of Wood-Carving and Kindred Arts, at the Albert Hall, South Kensington (opened last March), has closed, and the various objects are being removed. The collection, as we have pointed out, was largely representative, and has been visited and enjoyed by a large number of persons.

Mr. and Mrs. German Reed's Entertainment.—On Wednesday evening, October 20th, a new first part will be produced, entitled "A Turquoise Ring," from the pen of Messrs. W. E. Godfrey and E. W. Craigie; the music supplied by Mr. Lionel Benson. Mr. Corney Grain has also a new musical sketch, "The Haunted Room," which he will give for the first time on the same evening.

TENDERS

For the erection of two shops at Turnham-green, for Mr. O. Davies. Mr. E. Monson, jun., architect:—

French	£1,348	0	0
Tye & Bartlett	1,335	0	0
Childs	1,222	0	0
Brunsden	1,189	0	0
Warr	1,167	0	0
Battley	1,097	0	0
Maton	1,075	0	0
Stone	1,070	0	0
Beach	1,028	0	0
Lyford (accepted)	956	0	0

For alterations to No. 84, Carlisle-street, N.W., for Messrs. Davies & Evans. Mr. E. Monson, jun., architect:—

Millson	£348	0	0
French	298	0	0
Beach	295	0	0
Sawyer	291	0	0
Fernley	285	0	0
Gann (accepted)	250	0	0

For new cottage, Woking, Surrey, for Mr. Robert East. Mr. Henry Peak, architect:—

Swayne, Guildford	£565	0	0
Wilson, Woking	494	0	0
Shears, Maybury	475	0	0
Harris, Woking	470	0	0
Butt, Woking	444	0	0
Whitburn, Woking (accepted)	400	0	0

For pulling down and rebuilding Nos. 15 and 16, Walbrook, City. Mr. Alexander Peebles, architect:—

Ashby & Horner	£9,083	0	0
Ashby Bros.	8,993	0	0
Brass	8,649	0	0
Morter	8,208	0	0
Ramsey	8,063	0	0
Conder	7,687	0	0
Clarke & Bracey	7,610	0	0
Lawrence	7,498	0	0
Perry & Co. (accepted)	7,322	0	0

For the erection of twenty-one cottages at Ealing, for Mr. W. White, Park-road, Ealing:—

Hegarty	£5,040	0	0!
French	4,578	0	0
Flett	4,557	0	0
W. Ladd	4,159	0	0
Coats & Son	4,158	0	0
Pierce	4,095	0	0
Higgs	3,800	0	0
Childs	3,700	0	0
G. White	3,501	0	0
Haines	3,500	0	0
Cox	3,465	0	0
Stone	3,465	0	0
Warr	3,192	0	0
Squelch	3,150	0	0
Burgess & Co.	3,099	0	0
Monk	3,045	0	0
Balsam Bros.	2,998	0	0
Brunsden	2,935	0	0
Richardson	2,850	0	0
Roberts	2,750	0	0
Prescott	2,748	0	0
Lovell	2,616	0	0
Weeks & Rosenberg *	2,500	0	0
Vaughan	2,600	0	0
Bull Bros.	2,597	0	0
F. White	2,462	0	0
J. Ladd	2,200	0	0!

* Exclusive of drainage, at 2s. per foot run.

For additions to mansion at Coombe Hurst, Kingston-hill, for Mr. H. F. Clare Vyner. Mr. W. T. Sams, architect. Quantities by Messrs. J. & A. E. Bull:—

Morris	£6,098	0	0
Bywaters	5,800	0	0
Higgs & Hill	5,744	0	0
Arrowsmith	5,692	0	0
Bowden & Dorrell	5,678	0	0
Macey & Sons	5,549	0	0
Knight & Sons, Chertsey (accepted)	5,354	0	0

For re-building Nos. 116 and 117, New Bond-street, and erection of picture-galleries, for Messrs. Gammon & Vaughan. Mr. W. T. Sams, architect. Quantities by Messrs. J. & A. E. Bull:—

Coles, Bros.	£5,393	0	0
Smith & Co.	5,135	0	0
Hall, Beddall, & Co.	4,995	0	0
Higgs & Hill	4,930	0	0
Chappell	4,834	0	0
Downs & Co.	4,749	0	0
Bywaters, London	4,569	0	0

For alterations to bar, &c., at The Cedars, Lavender-hill, Wandsworth-road, for Mr. Fagan, jun. Mr. Henry Roberts, architect:—

Nicholls	£370	0	0
Lathey Bros.	337	0	0
Simpson	319	0	0
Goddart & Co., Mile-end (accepted)	287	0	0

For sundry repairs, &c., at No. 133, High-street, Notting-hill, for Mrs. C. Jack. Mr. W. Nunn, architect:—

Adams	£297	15	0
Mansell	245	0	0
Lamble	237	0	0
Head & Son	188	0	0

For warehouse, Heddon-street, Regent-street, for Mr. W. F. Williams. Mr. Cubitt Nichols, architect. Quantities supplied by Mr. H. Foster:—

Cock & Son	£6,265	0	0
Greenwood	6,247	0	0
Little & Son	5,798	0	0
Nightingale	5,671	0	0
Bywaters	5,575	0	0
Woodward	5,555	0	0
Langmead & Way	5,550	0	0
Conder	5,433	0	0
Hutchingson	5,395	0	0

For erecting offices, &c., No. 25, Bedford-row, for Mr. R. A. Notley. Mr. Frederick C. Notley, architect. Quantities by Mr. W. Barrett:—

Macey & Sons	£4,392	0	0
Hart	4,364	0	0
Hayworth	4,350	0	0
J. & J. Greenwood	4,333	0	0
Axford	4,320	0	0
A. G. Bolding	4,283	0	0
Tarrant & Son	4,223	0	0
Patman & Fotheringham	4,194	0	0
Nightingale	4,171	0	0
Langmead & Way	4,150	0	0
Morter	4,043	0	0
Lawrence	3,994	0	0

For pulling down and re-building the Prince Regent public-house, Sidmouth-street, Gray's Inn-road, for Mr. Rosenburg. Mr. A. Latham, architect. Quantities supplied:—

Renouf	£3,593	0	0!
Spencer & Co.	2,665	0	0
Sawyer	2,468	0	0
Stephens & Co.	2,389	0	0
Pringle	2,378	0	0
Smith & Son	2,365	0	0
Henye	2,298	0	0
Wheeler	2,245	0	0
Allen	2,230	0	0
Rosen & Co.	2,220	0	0
Beale	2,210	0	0
Gould Bros.	2,139	0	0
Ward	2,130	0	0
Bull Bros	2,097	0	0
Sharman	1,999	0	0
Angood	1,990	0	0
Hutchinson	1,980	0	0
Casey & Co.	1,985	0	0
Williams	1,959	0	0
Wagner	1,890	0	0!

For detached house, St. Stephen's-road, Ealing, for Mr. George Penn. Mr. Walter Graves, architect. No quantities:—

Toms	£1,827	0	0
Hook & Oldrey	1,677	0	0
Facer	1,440	0	0
Penny & Co.	1,402	0	0
Bolding	1,370	0	0

For detached-house, Edgehill-road, Ealing, for Mr. Samuel Smith. No quantities:—

Hook & Oldrey	£1,356	0	0
Facer	1,220	0	0
Penny & Co.	1,211	0	0
Toms	1,190	0	0
Bolding	950	0	0

For extension of promenade and works connected therewith, at Barmouth. Mr. Thomas Roberts, engineer:—

Evans & Jones, Dolgelley	£1,895	19	9
Owen, Portmadoc	1,843	0	0
Jones, Barmouth	1,656	0	0
Davies, Portmadoc	1,552	0	0
R. Williams, Harlech	1,534	0	0
Davies, Waenfawr	1,500	0	0
Hughes, Portmadoc	1,475	0	0
Pritchard, Portmadoc	1,349	0	0
Jeffreys, Colwyn Bay	1,138	2	8
G. Williams, Harlech (accepted)	1,113	1	6

Accepted for the erection of parsonage-house and boundary-walls at Allenheads, Northumberland, for the Rev. J. M. Lister. Mr. Edward Shewbrooks, architect.

Excavator, Bricklayer and Mason, Slater and Plasterer's Work.

Charlton, Allendale, Northumberland £917 10 0

Carpenter and Joiner, Plumber, Painter, and Glazier's Work.

Fairlamb, Allendale, Northumberland £667 0 0

Boundary Walls.

Charlton £160 0 0

For erecting two shops and dwelling-houses at Carshalton, Surrey, for Mr. B. Clarke. Mr. R. W. Price, architect. Quantities by Mr. W. H. Barber:—

Tribe	£2,060	0	0
Humphries	2,010	0	0
Smith	1,997	0	0
Wale	1,970	0	0
Hobbs	1,940	0	0
Taylor	1,900	0	0
Richardson	1,900	0	0
Ward	1,892	0	0
Howe & White	1,880	0	0
Steward (accepted)	1,738	0	

For a pair of cottages for Mr. C. G. Hale, Seal, Kent. Mr. Edwin T. Hall, architect:—

Constable, Pensburst	£480	0	0
Julian & Co., Southwark (accepted)	467	0	0

For alterations and repairs at Euston-road, for Mr. F. H. Warr. Mr. Edwin T. Hall, architect:—

G. & T. Riddell,* Newington-butts	£600	0	0

* Accepted.

For pair of cottages, at Biggenwood, Lower Norwood, for Mr. James Epps. Mr. Edwin T. Hall, architect:—

Julian & Co., Southwark (accepted)	£450	0	0

For alterations and additions to Hill Court, Four Elms, Kent, for Mrs. J. H. Barclay. Mr. Edwin T. Hall, architect:—

Punnett & Sons, Tunbridge (accepted)	£657	0	0

For new carriage-sheds, at Hammersmith, for the Metropolitan Railway:—

Hutchinson	£3,027	0	0

For main approach road at the intended Gloucestershire Second County Lunatic Asylum. Messrs. John Giles & Gough, architects. Quantities by Mr. C. H. Goode :—

Nicholson	£1,696	0	0
Small & Son	1,680	0	0
Meredith	1,643	0	0
King (accepted)	1,418	0	0

For two pairs of cottages at the Gloucestershire Second County Lunatic Asylum :—

King	£1,568	0	0
Jones & Co.	1,395	0	0
Clutterbuck	1,300	0	0
Meredith	1,243	0	0
Coleman (accepted)	1,243	0	0

For the erection and completion of a small Cemetery Chapel for the Redruth Burial Board, Cornwall. Mr. J. Willey, architect :—

Julian & Sons (accepted)	£370	0	0

For the re-building and renovating of Feock Wesleyan Chapel, Cornwall. Mr. Silvanus Trevail, architect :—

Julian & Sons (accepted)	£250	0	0

For the erection and completion of a new dwelling-house, Penzance, Cornwall, for Mr. C. C. Ross. Messrs. l'Anson & Son, architects :—

Julian & Sons (accepted).

For alterations and renovations of new shop and premises, Hayle, Cornwall, for Messrs. J. H. Trevithick & Sons. Mr. J. D. Trounson, architect :—

Julian & Sons (accepted)	£350	0	0

For residence, near Shide Cross, Isle of Wight. Mr. Thomas Dashwood, architect :—

Jolliffe, Newport	£1,850	0	0
Grant, Newport	1,825	0	0
Plesse, Woolton	1,767	0	0
Jenkins, Newport and Ryde	1,645	0	0
Barton, Ryde (accepted)	1,640	0	0
Dyer, Newport	1,550	0	0

For the construction of roads and sewers upon the Broomwood Park Estate, Clapham Common. Messrs. Hammack & Lambert, surveyors :—

Harriss	£9,960	0	0
R. & C. Neale	9,500	0	0
Cardus	8,990	0	0
Rigby	8,932	0	0
Neal	8,600	0	0
Pound	8,292	0	0
Bloomfield	7,882	0	0

For alterations and additions to the Duke of York Hotel, Regent-road, Salford. Mr T. Stevens, architect :—

Clarke (accepted)	£1,200		

For re-building the Cock Tavern, Marsh-street, Walthamstow, for Mr. George Archer. Messrs. Hills & Fletcher, architects :—

Johnson, Walthamstow (accepted)	£1,600	0	0

For 12-in. pipe sewer at St. George, near Bristol, for the St. George Sanitary Authority. Mr. W. Dawson, C.E., surveyor :—

Cryer, Hanham	£289	10	0
Beaven, Bedminster	242	5	0
Martin & Thomas, Bristol	183	7	8
Adams, Bristol	170	2	11
Jones, Bristol	168	9	0
Brittan, St. George (accepted)	161	3	9

For the repair and maintenance of about four miles of main roads for the St. George Sanitary Authority, Bristol. Mr. W. Dawson, C.E., surveyor :—

Cryer, Hanham	£1,700	0	0
Grindell, St. George	1,247	0	0
Jones, Bristol (accepted)	955	0	0

For the reconstruction of 780 yards of brick sewer, ft. 6 in. by 3 ft., for the St. George Sanitary Authority, Bristol. Mr. W. Dawson, C.E., surveyor :—

Facey, Manchester	£2,499	8	0
Hunter, Bristol	1,877	19	0
Mereweather, Bedminster	1,775	7	0
Monks, Fishponds	1,501	10	0
Emery, Bristol	1,422	14	0
Parfitt, Eastville	1,109	16	2
Jones, Bristol	998	0	0
Rumboll, Bristol (too late)	995	7	9
Yelland, Fishponds (accepted)	757	19	9

For a detached villa-residence, Baldslow-road, Hastings, for Mr. J. Cockburn. Messrs. Cross & Wells, architects :—

Vidler	£4,167	0	0
C. & E. Harman	4,113	0	0
Punnett & Sons	4,083	0	0
Rhodda	3,996	0	0
Austin	3,895	0	0
Hughes	3,858	0	0
Womersley	3,800	0	0
Jones & Co.	3,698	0	0

For additions to mansion and new stabling at the Grove, Chalfont St. Giles's, for Mr. G. H. Salisbury. Mr. W. T. Sams, architect. Quantities by Messrs. J. & A. E. Bull :—

Knight & Sons, Chertsey (accepted)	£1,210	0	0
Stable Fittings.			
Musgrave, Bond-street (accepted)	£627	1	6

For works to houses and shops, for Mr. G. H. Tatham, North Kensington. Messrs. Ebbetts & Cobb, architects. No quantities supplied.

Laws	£2,040		

For four shop-fronts and fittings, and fixings, Nottin-g hill. Messrs. Ebbetts & Cobb, architects :—

Laws	£180	0	0

For repairs and decorations to No. 12, Cornwall-terrace, Regent's Park, for Mr. Charles Burge. Messrs. Ebbetts & Cobb, architects :—

Sanders (accepted)	£400	0	0

For further works inside, and also to stables in rear of same premises :—

Sanders (accepted)	£233	4	11

TO CORRESPONDENTS.

Road Formation (several letters on this subject have reached us too late for consideration this week).—H. C. S. (send address, that proof may be forwarded. Mislaid).—E. P. (drawing was paid for to artist who made it).—R. K. (report reached us, but was put aside).—E. & C. (should send lists).—T. W. H. (should have sent names and amounts).—R. (ditto).—R. H. (possibly to prevent down-draught when stove is not alight).—J. J. & Sons.—H. P.—H. J. N.—S. W.—G. M.—Dr. P.—J. C. S.—R. B.—D.—Br. B.—A. P.—Major B.—T. D.—I. P. & W.—H. H.—F. H.—J. B.—W. T. W.—J. R. T.—Bosser.—H. L.—H. & F.—W. B.—T. H. B.—A. G. B.—J. N. J. & Sons.—W. E. H.—Mrs. P.—C. & W.—E. M. & Son.—R. M. B.—C. M.—C. R.—P. S.—P. P. P.—W. T. S.—E. L. B.—J. H.—J. D. & Son.—J. McG.—F. C. N.—Mr. S.—Messrs. D.—S. R. L.—H. S. C.—T. B.—W. G.—Wood Co.—J. S.—W. B.—H. W. M. (thanks).—F. W. (next week).—S. H. T. next week).

All statements of facts, lists of tenders, &c. must be accompanied by the name and address of the sender, not necessarily for publication.

We are compelled to decline pointing out books and giving addresses.

Note.—The responsibility of signed articles, and papers read at public meetings, rests, of course with the authors.

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Addressed to No. 46, Catherine-street, W.C.

Advertisements for the current week's issue must reach the office before THREE o'clock p.m. on THURSDAY.

The Publisher cannot be responsible for DRAWINGS, TESTIMONIALS, &c. left at the Office in reply to Advertisements, and strongly recommends that of the latter COPIES ONLY should be sent.

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And Farleigh Down.
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